AVIATION WEEK
AUG. 1, 1949
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THE FAMOUS L-M HIGH INTENSITY RUNWAY LIGHT

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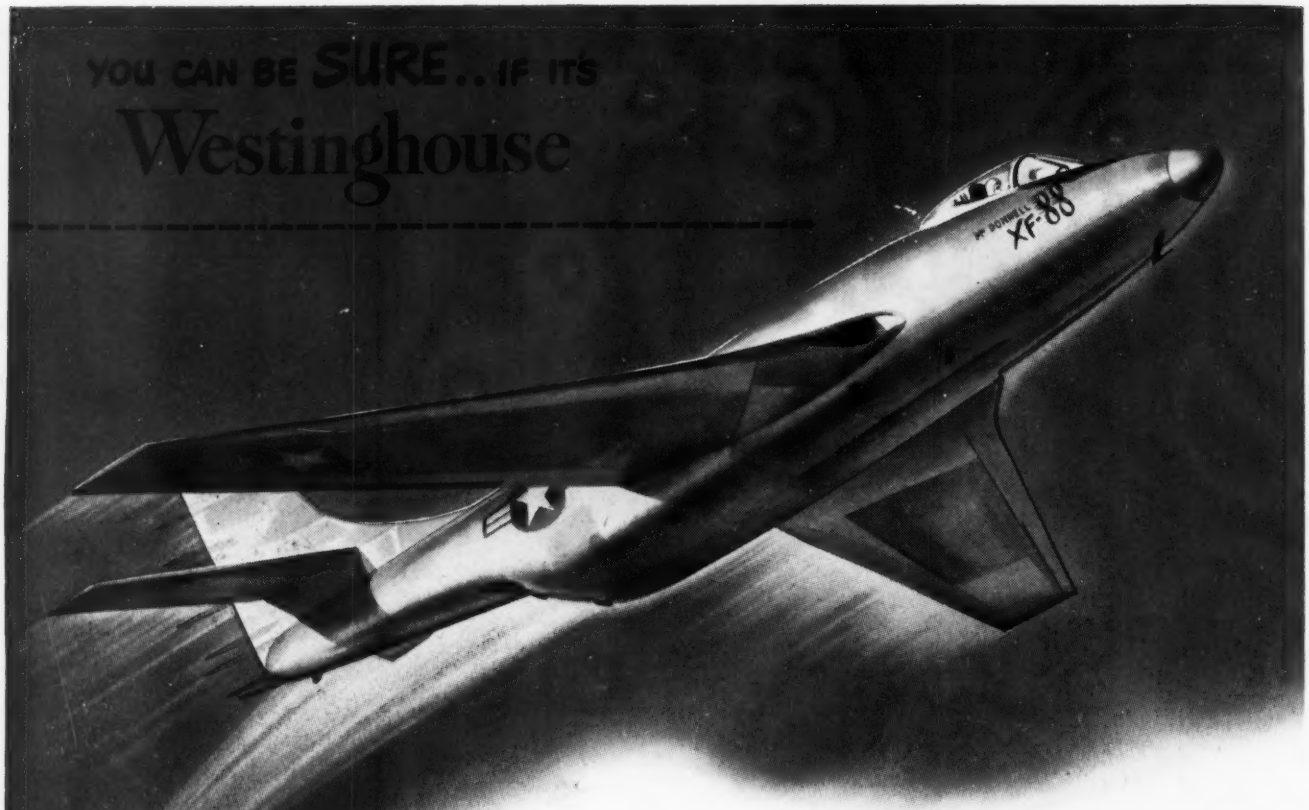

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power the McDonnell XF88 "Voodoo"

The XF88 . . . Air Force fighter . . . is the latest to join the ranks of McDonnell jet planes for the U. S. armed forces. Like its forerunners . . . the McDonnell FH-1, "Phantom", the F2H "Banshee", and the XF85 "Goblin" . . . the XF88 is powered by Westinghouse Turbojet Engines.

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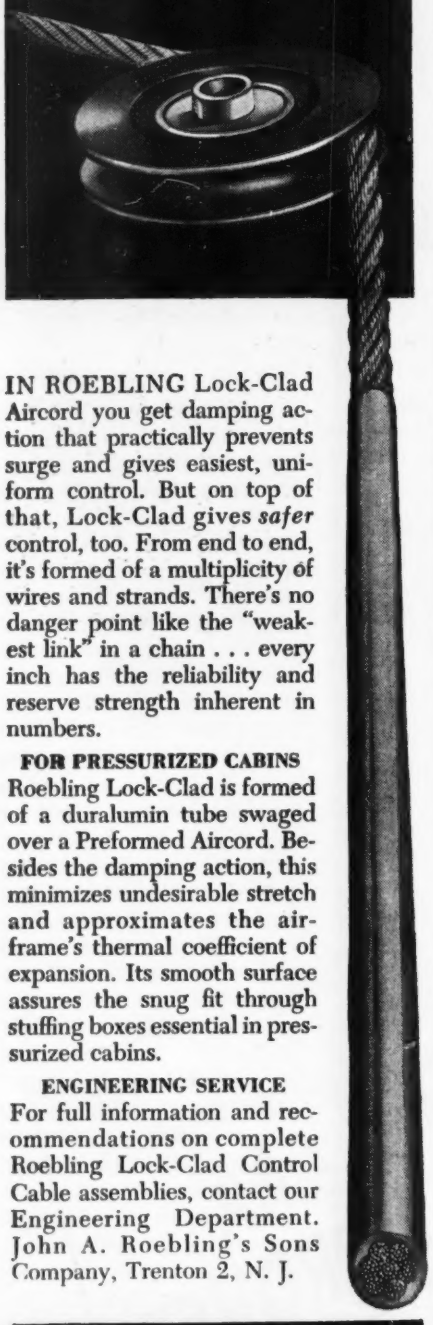

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ROEBLING

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Vol. 51, No. 5

AVIATION WEEK

August 1, 1949

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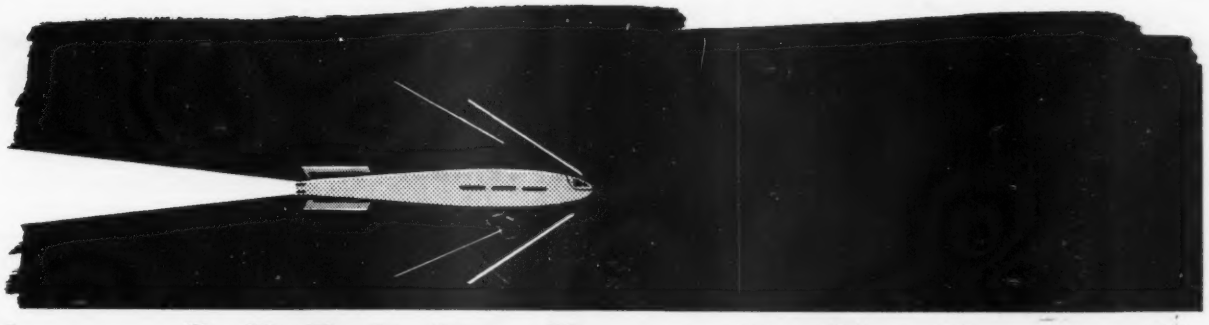

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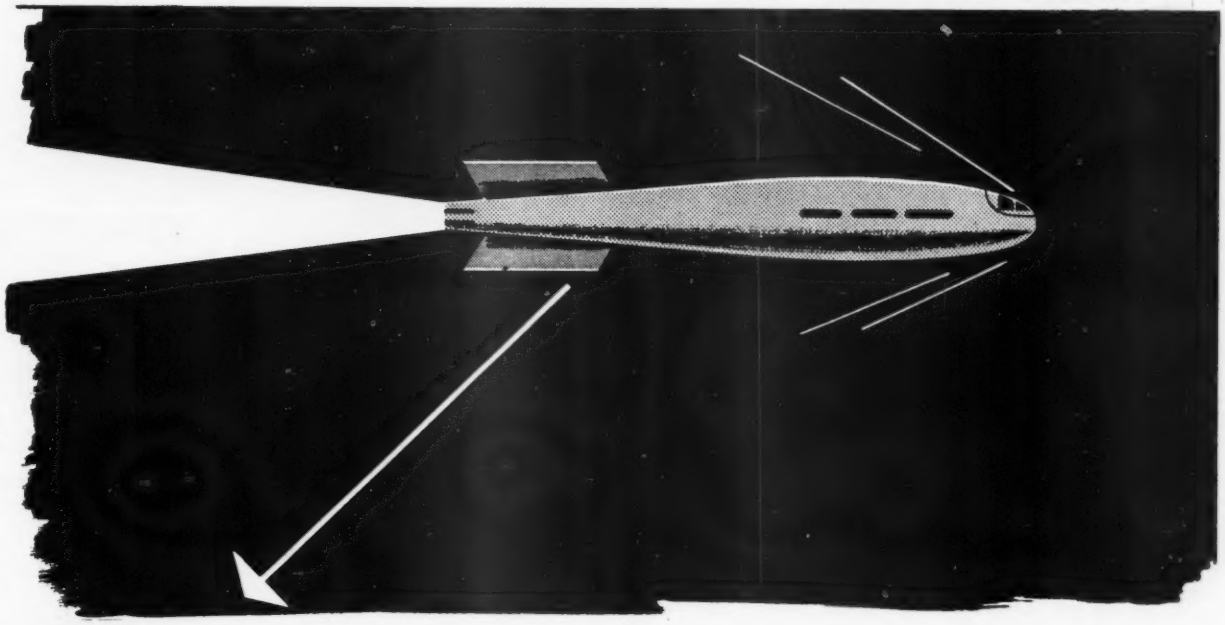

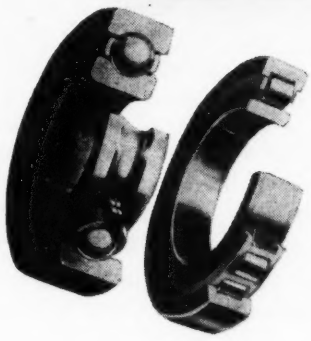

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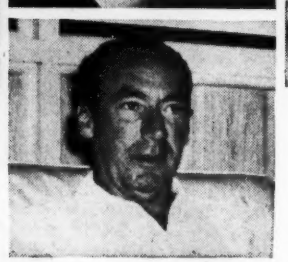
NATIONAL AIR RACES

CLEVELAND, SEPTEMBER 3, 4, 5



Headquarters here for the National Air Races. Eli Ellison, President (at top, right) and his partner, Ted Byron, Treasurer, see that customers get unbeatable service. Aero-Ways, Inc. has experienced engine mechanics and topflight facilities. Quality is the keynote — as witness the fact that Aero-Ways has handled Texaco Aviation Lubricants and Fuels exclusively for more than 16 years.

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TEXACO Lubricants and Fuels

FOR THE AVIATION INDUSTRY

NEWS SIDELIGHTS

Fighter Refueling

USAF is serious about the use of aerial refueling as a quick extension of jet fighter ranger. Initial experiments have been made with the Boeing flying boom type refueling equipment (AVIATION WEEK, July 18) at Muroc, and operational procedures will probably be worked out for the North American F-86-F-93 series which have an extremely short range at present, late model Republic F-84s which will be used primarily for ground support operations, and the Lockheed F-90 penetration fighter.

USAF experts see aerial refueling as the only method available in the immediate future to provide escort for medium and light bombers. Meanwhile, Britain's Royal Air Force has shown little interest in the project despite a demonstration by Sir Allan Cobham's Flight Refueling, Inc. in which a twin-jet Gloster Meteor was refueled in the air from a Lancastrian tanker. RAF loaned the Meteor for the demonstration.

Jab at Landis

Washington hubbub over the "five percenters" who use their influence to get government contracts for clients has brought a demand for investigation of former holders of high federal jobs who now represent private interests before the agencies with which they were once associated. Sen. Hugh Butler (R., Neb.) included former CAB Chairman James M. Landis in his list of ex-officials whom such an inquiry should cover.

Ironically, Landis' biggest job since leaving CAB has been his free legal representation of American Overseas Airlines employes who are fighting the proposed sale of AOA to Pan American Airways. Landis' partners in the Washington law firm of Landis, Gewirtz and Maclay also held important CAB posts. L. Welch Pogue, CAB chairman before Landis, is a Washington attorney representing airline interests.

NACA Protest

National Advisory Committee for Aeronautics has vigorously protested its incorporation in the Commerce Department, recommended by the Hoover Commission. The Commission's proposal was that Commerce be reorganized into two divisions—a transportation service and an industrial and commercial service. Under the transportation service would be bureaus for the merchant marine, civil aviation, highway transportation, railroad transportation, aids to navigation, and a bureau for weather.

Civil Aviation Bureau would take over all the current activities of Civil Aeronautics Administration, National Advisory Committee for Aeronautics, and air safety enforcement functions of Civil Aeronautics Board. In a letter to Chairman John McClellan (D., Ark.) of the Senate Committee on Expenditures in Executive Departments, NACA urged that "its status as an independent agency . . . be continued." Commerce Department, it is understood, is opposed to taking over activities of the NACA.

If and when the President submits the Commerce reorganization plan to Congress, it will take a constitutional majority of either House to veto it.

Center Site

Leading contender for location of a $1 billion Air Force "air engineering development center" is southern Nevada near Las Vegas. USAF engineers completed a survey of the location recently. Other top contenders for the center are an area in eastern Washington and the Tennessee Valley region. USAF now is evaluating reports on the three areas.

Legislation authorizing $150 million to initiate construction of the center has been approved by the Senate Armed Services Committee. If the authorizing legislation is approved this session, USAF plans to expend $50 million out of its contingent fund for development of the center over the 1950 fiscal year.

Symington's Future

Capital Hill politicos won't be surprised if Air Force Secretary W. Stuart Symington makes a bid for the Democratic nomination in the Missouri Senatorial race scheduled for 1950. Missouri's two Republican Senators—Forrest Donnell and James P. Kem—have been a vexing thorn in the side of the Truman Administration. Donnell is up for reelection in 1950 and President Truman is anxious to put a strong candidate in the field against him to recapture some of the president's local political prestige. Symington's legal residence is still St. Louis, Mo.

Fairchild Board

USAF'S Fairchild Board is meeting again in the Pentagon. Aircraft manufacturers are anxiously eyeing the meeting for possible shifts in USAF fiscal 1950 procurement program. One subject on the Board's agenda: military transport requirements.

O'Connell Protest

CAB Chairman Joseph O'Connell's protest against legislation requiring that all future air agreements take the form of treaties, subject to Senate ratification, has had little effect on Capitol Hill.

O'Connell declared: "Our opposition . . . is based primarily upon the practical consideration that in effecting exchanges of operating rights the time element is often of extreme importance.

"To prohibit consummation of all international aviation agreements until ratified as treaties would seriously impede international aviation, and would place the U. S. in a disadvantageous position in international bargaining for reciprocal rights. This is particularly true in instances requiring prompt action in which . . . representatives of foreign governments may be empowered to take final action without such restrictions."

Chairman Edwin Johnson (D., Colo.), of the Senate Interstate and Foreign Commerce Committee told AVIATION WEEK that despite O'Connell's protest, he and members of his committee plan to push for Senate passage of the legislation at this session.

Bigger They Are

CAA's growing tendency to ignore the small commercial airports, in favor of the big showy municipal fields was pointed up sharply again last week in appointments of a 12-man airport advisory committee. All were municipal airport managers, without one fixed-base operator included.

A CAA spokesman advised AVIATION WEEK that a California commercial airport operator had been asked to serve but had turned it down on account of expense. Apparently the invitation was not extended to other fixed-base operators close to Washington. It is indicated that the oversight will probably be remedied by appointment of one or more commercial field operators when the expiration of the first one-year terms occurs.

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FOR

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REPUBLIC

Thunderjet

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AVIATION CALENDAR

Aug. 3—Forum, Corporation Aircraft Owners Assn., Hotel Statler, Washington, D. C.

Aug. 6-7—Second annual International Air Fair sponsored by Aero Club of Michigan, Willow Run Airport.

Aug. 6-14—1949 West Coast soaring championship, Palmdale Airport, Calif.

Aug. 7-14—Second annual southwestern soaring contest, NTAC airport, Grand Prairie, Tex.

Aug. 22-23—ARTC, western division meeting, Boeing plant, Seattle, Wash.

Aug. 23-26—American Institute of Electrical Engineers, Pacific general meeting, Fairmount Hotel, San Francisco.

Aug. 25-28—Flying Farmers national convention, Fort Collins, Colo.

Aug. 29-Sept. 1—Aeromedical Assn., annual meeting, Statler Hotel, N. Y.

Sept. 1-7—International conference of Federation Aeronautique Internationale, Wade-Park Manor, Cleveland, Ohio.

Sept. 3-5—1949 National Air Races, Cleveland, Ohio.

Sept. 6-8—Annual spark plug and ignition conference, sponsored by Champion Spark Plug Co., Hotel Secor, Toledo, Ohio.

Sept. 7-11—10th Society of British Aircraft Constructors flying display and exhibition, Farnborough Airfield, Hampshire, England.

Sept. 9-12—Clinic on maintenance of industrial instruments, Instrument Society of America, Statler Hotel, St. Louis.

Sept. 18-20—International Northwest Aviation Council convention, Spokane, Wash.

Oct. 3-8—Twentieth anniversary meeting, Ninety-Nines, Waldorf-Astoria, New York.

Oct. 5-8—SAE national aeronautic meeting and aircraft engineering display, Biltmore Hotel, Los Angeles.

Oct. 30—Third annual San Francisco Air Fair, sponsored by Junior Chamber of Commerce, San Francisco Airport.

Oct. 30-Nov. 2—Annual convention, National Assn. of State Aviation Officials, New Orleans.

Nov. 9-11—Seventh annual meeting Aviation Distributors and Manufacturers Assn., French Lick Springs Hotel, French Lick, Ind.

Jan. 13-15, 1950—All-American Air Maneuvers, Miami.

PICTURE CREDITS

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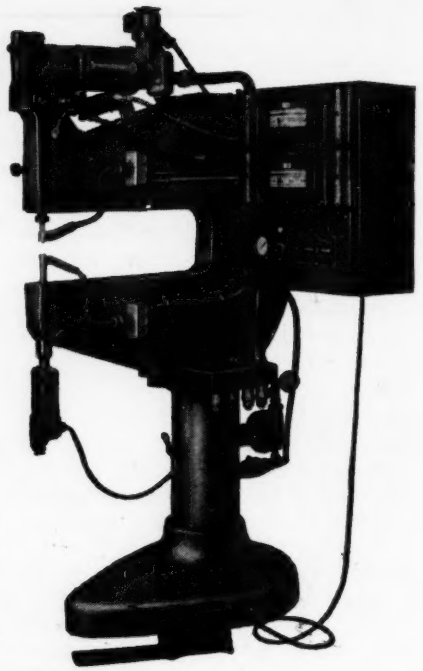

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HYDRAULIC RIVETERS • ELECTRIC TOOLS

NEWS DIGEST

DOMESTIC

New York Port Authority-Airlines feud has reached Gov. Thomas E. Dewey who requested representatives of both factions to meet with him last week. Dewey called the meeting, with approval of New Jersey Gov. Alfred E. Driscoll, "for the purpose of laying the groundwork for a solution to the problem."

Glenn L. Martin Co. has been awarded $6,651,000 in subcontract work by Grumman Aircraft Engineering Corp. Manufacture of outer wing panels, stabilizers, fins, nose and tail section fuselages and spare parts for the Grumman F9F will total $6,373,000. Other work covers engine cowlings for the AF-1 and AF-2 attack planes . . . Martin has increased its most recent loan request to the Reconstruction Finance Corp. from $500,000 to $1 million. This is for working capital to replace inventory sold to pay previous RFC loans.

Personal plane exports for June as reported to Aircraft Industries Assn. by ten companies totaled 47 valued at $187,075. Previous month's totals were 57 planes valued at $241,450.

Chance Vought Aircraft production workers will vote this week on whether they want to be represented in bargaining by United Auto Workers (CIO), International Assn. of Machinists (AFL), or no union. About 4400 of the company's 6500 employes will vote. Since Chance Vought's move from Stratford, Conn., to Dallas there has been no union at the plant.

Rear Adm. Gordon McLintock, superintendent of the U. S. Merchant Marine Academy at Kings Point, N. Y., was elected president of the Institute of Navigation. Paul Rosenberg was appointed technical advisor to McLintock.

Air Force achieved full independence last week when Transfer Order No. 40 by Defense Secretary Louis Johnson turned over to USAF the last of 100 functions previously performed by the Army.

New Civil Air Regulation covering temperature accountability for takeoff limitations on transport category airplanes becomes effective this week.

FINANCIAL

Douglas Aircraft Co. reported net income of $2,976,343 for first six months of fiscal 1949 ending May 31, after provision for taxes and profit-limitation requirements. Income is equivalent to $4.96 per share on 600,000 shares of capital stock outstanding. Sales and billing for the period were $52,122,930, an increase of nearly $10 million over 1948 half-year total of $42,796,767. Backlog on July 1 totaled $200,001,457, of which 98.2 percent was military orders and remainder commercial business.

Curtiss-Wright Corp. directors declared a third quarter dividend of 25 cents per share, payable Sept. 18, 1949, to holders of common stock of record Sept. 1, 1949. Third quarterly payment of 50 cents per share on the $2 annual dividend previously declared on Class A stock will also be paid on that date to holders of record Sept. 7, 1949.

General Electric Co. and affiliates reported profit available for dividends of $46,552,842 for first six months of this year, or 15 percent less than amount earned in that period last year. For the quarter ended June 30, 1949, earnings totaled $19,849,864. Consolidated net sales billed during first six months of 1949 totaled $801,756,516, 4 percent higher than the same period last year.

INTERNATIONAL

Colonial Airlines has challenged on constitutional grounds the new air agreement between Canada and the U. S. Carrier claims the agreement is invalid since it constitutes a treaty which has not been ratified by the Senate. Colonial has filed its motion with CAB.

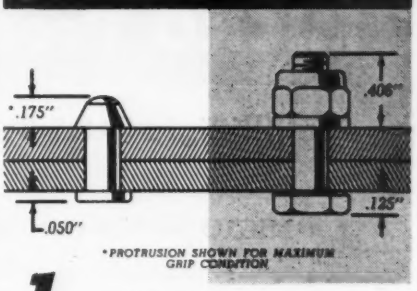
De Havilland Comet, turbojet-powered civil airliner, was scheduled to be shown to the public for the first time last week in Hatfield, England.

British Ministry of Civil Aviation has lifted its ban on passenger use of the Mark II and V Tudors, subject to certain modifications on the planes. Restrictions were imposed last January on all Tudor types following crash of the BSAA Tudor IV. Mark II and V Tudors have never been used on regular passenger service, but were employed on the Berlin airlift. Tudor IV is still restricted from carrying passengers.

India and Britain have broken off talks on a bilateral air agreement. Britain wants an agreement based on "equal opportunity," like those India has signed with other countries. But India is holding out for a formal prorating of traffic. BOAC now runs 13 flights per week to and through India, while Air-India International so far has only two flights per week to Britain.

Humphrey Verdon Roe, British aircraft manufacturer, died in London after a long illness. Roe, 71 formerly was managing director of A. V. Roe & Co., Ltd., which he established with his brother, Sir Alliott Verdon Roe.

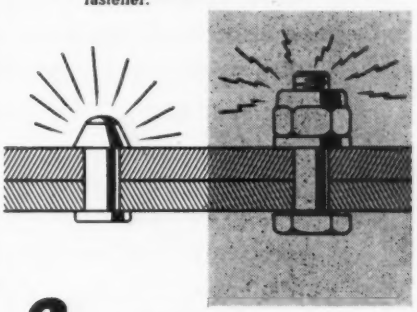
3 HI-SHEAR FACTS THAT COUNT!



*PROTRUSION SHOWN FOR MAXIMUM GRIP CONDITION

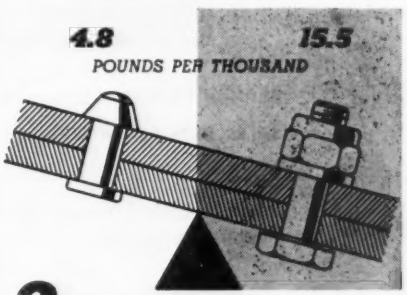
1 minimum protrusion

Hi-Shear rivets have the smallest "Headed Ends" of any high strength fastener.



2 maximum smoothness

The smooth spherical rivet end eliminates chafing of adjacent fuel cells or other equipment. Hi-Shears eliminate hazards in aircraft areas which are accessible to the flight crew, passengers, maintenance crews and cargo.



3 less weight . . . . . .

Hi-Shear rivets are the lightest high strength fasteners available.

note . . . . . .

Comparisons of size and weight shown above based on Hi-Shear NAS 178-6-5 pin, and NAS 179-6 collar; AN 3-5A bolt. AN 365-1032 nut and AN 960-10 washer.

U.S. and foreign patents — Trademark registered

THE hi-shear RIVET TOOL CO.
1559 SEPULVEDA BOULEVARD
HERMOSA BEACH, CALIF.

PHEOLL MANUFACTURING COMPANY
5700 ROOSEVELT ROAD
CHICAGO 50, ILLINOIS

Aircraft Design Engineers Find

MICRO Precision Switches

Fulfill Rigid "AN" Requirements in Small Space

MICRO precision switches are widely used in aircraft designs where components must combine positive, dependable performance with utmost economy of size and weight.

Selecting just the proper MICRO precision switch to meet the specific demands of a particular application is simplified by the more than 3900 shapes, sizes, weights, actuators and electrical characteristics which MICRO SWITCH makes available.

MICRO engineers are specialists in solving switching problems. Their valuable aid is at the service of aircraft design engineers faced with the many switching problems peculiar to aircraft.

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MICRO MS SWITCH

A DIVISION OF FIRST INDUSTRIAL CORPORATION

FREEPORT, ILLINOIS, U.S.A.

MICRO ... first name in precision switches

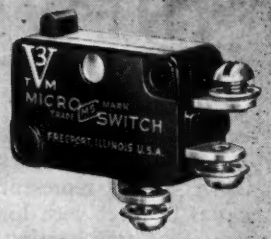
BRANCH OFFICES: Chicago • New York • Boston • Cleveland • Los Angeles

SALES REPRESENTATIVES: Portland • St. Louis • Dallas • Toronto

MICRO V3-1 Switch AN 3234-1

Size of case: 1 3/32" x 5/8" x 13/32"

Exact size



D-C Rating: 6 amperes, 28.5 volts at 45,000 ft. altitude; 10 amperes, 28.5 volts at sea level.

MICRO 1VA1 Rotary Actuator Housing

Size of housing: 3 9/32" x 1 11/16" x 1".

For enclosing MICRO V3-1 Switch (AN3234-1). Adjustable through 360° . . . total travel 90° in either direction.

MICRO 2VB1 Plunger Actuator Housing

Size of housing: 2 9/16" x 1 1/2" x 1 1/32"

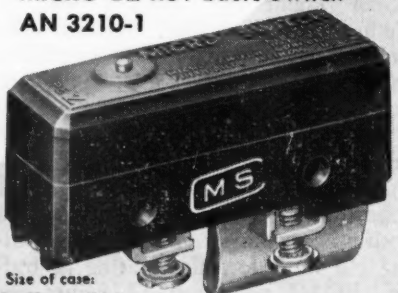
For either one or two MICRO V3-1 (AN3234-1) Switches. Plunger sealed in synthetic rubber boot.

MICRO LMR-1 Housing AN 3233-1

Size of housing: 2 13/16" x 3" x 1"

For BZ-R31 (AN3210-1) Basic Switch. Die cast aluminum. Rotary arm adjustable through 360° . . . total travel 90° in either direction.

MICRO BZ-R31 Basic Switch AN 3210-1



Size of case: 1 15/16" x 27/32" x 31/64"

A single-pole, double-throw basic switch design which meets Army-Navy aeronautical standards.

MICRO BZE-7RNT1 Die Cast Enclosed Switch AN3217-1

Lightweight but rugged housing with sealed plunger. Basic switch enclosed within housing.

Size of housing: 3 13/64" x 1 25/32" x 1"

WHO'S WHERE

► **Promotions:** McDonnell Aircraft Corp. named **Don R. Berlin** executive vice president. He has been v-p in charge of engineering and contracts. **C. Warren Drake** steps up to v-p manufacturing, from his old post of administrative v-p. **Kendall Perkins,** formerly Berlin's assistant, moves up to manager of engineering . . . Curtiss-Wright Corp.'s propeller division promoted **Francis R. O'Leary** to the post of general manager. **George W. Brady** becomes director of engineering of the division, but also supervises engineering development of new rocket power plants . . . Jack & Heintz Precision Industries' senior vice president **Frank R. Kohnstamm** moves up to the president's post, as former president **Kenneth G. Donald** becomes chairman of the board.

► **New Jobs:** Airwork Corp., Millville, N. J., appointed **Norman K. Toerge** its regional sales manager, based in New York City . . . **V. C. Schorlemmer** has come out of retirement to take over as secretary and treasurer of Consolidated Vultee Aircraft Corp. to succeed the late **W. M. Shanahan.** Schorlemmer retired a year ago as Convair's director of finance . . . **Carl Freidlander,** former president of Aeronca Aircraft, now is with Roy S. Durstine, Inc., advertising agency in New York City . . . **Sydney H. Carter** moves over from Luscombe to become advertising and sales promotion manager of Texas Engineering and Mfg. Co. . . . **H. C. Pettit** is acting sales manager at Aeronca, filling in for **Floyd B. Simmen** who begins today a leave of absence on order of his doctor . . . **Temple N. Joyce,** president of Wings Engineering Corp., Baltimore, reports that **Comdr. Alan P. Smith,** USNR, has been elected secretary-treasurer and a director, and that **Paul F. Gibson** also has joined the board. Gibson heads the aerodynamics section of the corporation, which is working on remote control systems for testing piloted aircraft . . . **Roland Gilbert** begins today his duties as chief of the administrative bureau of the International Civil Aviation Organization in Montreal. He comes from Britain where he has been assistant secretary in the Ministry of Civil Aviation . . . **William E. Osborne** is the new chief of the electronic and guidance division of Marquardt Aircraft Co., Van Nuys, Calif. He was a radar design engineer with Gilfillan Bros. in Los Angeles.

► **Where to Reach Them:** New address of **J. Carlton Ward, Jr.,** former chairman of Fairchild E&A Corp., is Colton Street, Farmington, Conn. Scripps-Howard reported he is in line to become president of Cornell University.

INDUSTRY OBSERVER

► **Aug. 4 has been set by Sensenich Corp., Lancaster, Pa., as deadline for orders for its new metal fixed-pitch propeller designed for Goodyear midget race planes, if delivery is to be made in time for the Cleveland National Air Races. Sensenich say the metal two-blader has shown a 10 mph. increase in top speed, 16 percent improvement in acceleration, and better rpm. spread characteristics than its best comparable wood propeller. Incidentally, Sensenich wood propellers were on both the 1947 and 1948 winning Goodyear midgets. Designed for 190-cu.-in. displacement engines, the new racing prop is priced at $250.**

► Airlines operating Boeing Stratocruisers have been asked to join with Air Materiel Command in an engineering study of factors in the recent engine cowling problems experienced with the double-decker transport's Pratt & Whitney R-4360 engines.

► **Doman Helicopters at Danbury, Conn., reports test pilot Al Bott has flown a flying test bed R-6 fuselage with a Doman four-blade rotor system for as long as 45 minutes without touching the stick, pitch control or throttle. Feat is attributed to the dynamic balance of the rotor system.**

► Texas Engineering & Manufacturing Co., Inc., Dallas, has been test-flying an experimental Swift two-placer with 145-hp. engine, and is studying the 1950 market for such a plane, expected to sell for around $6000 and to cruise at around 150 mph. The new model TE-2A is not to be confused with the 145-hp. TE-1A tandem military type trainer.

► **Piper Aircraft Corp., Lock Haven, Pa., has a contract to build 105 liaison planes designated L-18B for the Turkish Air Force. Planes will be used in flight training. Plane is similar to PA-11 Trainer with 65-hp. Continental engine.**

► Boeing Airplane Co., Wichita division, is taking delivery on a new 150-ton capacity Hufford stretch-wrap forming machine, costing approximately $175,000, to be used to form skin contours for wing, fuselage and extruded structural parts. Machine will handle sheets up to 66 in. by 144 in. and extrusions within these limits.

► **Beech Aircraft Corp. is equipping a four-place Bonanza for a trans-Atlantic hop proposed by J. M. Brondello, Italian pilot. Plane will be equipped essentially as was Bill Odom's Waikiki Beech plane which flew approximately 5000 miles nonstop, but Beech Aircraft will not sponsor the Italian's flight as it did Odom's. Brondello plans to take off from Portugal in August and fly to N. Y.**

► North American Aviation, Inc., has delivered the first of an order for 268 advanced trainers (T-28) for static test at Wright Field structures laboratory, a month ahead of schedule. Delivery was made in a C-82 transport. First flying T-28 is expected to get off the ground within next few weeks.

► **Bevo Howard gave his first public exhibition in his Warner-powered Buecker-Jungmeister recently at Houston. Bevo tells AVIATION WEEK that the Warner 185 hp. engine in addition to offering increased power over the original German engine has provided almost exactly the same balance, extremely important in the kind of aerobatics Bevo does.**

Vol. 51, No. 5

AVIATION WEEK

Aug. 1, 1949

Air Force Revising its Lists of Suppliers

Industry gets new AMC master catalog in move to modernize procuring service.

Hundreds of contractors last week were receiving new Air Materiel Command catalogs listing articles used by the Air Force, with instructions to mark items they would like to supply and return the list by Aug. 15.

The catalog distribution was one step in a thorough revision of AMC source of supply listing methods. Observers said it marked the first time suppliers were able to select from a complete procurement list the items on which they wished to bid.

Manufacturers received only those catalogs in which AMC thought they would be interested. But 27 were listed in an accompanying index. Potential suppliers were told that catalog copies could be obtained from the Commanding General, Air Materiel Command, Wright-Patterson Air Force Base, Dayton, Ohio, Attention: MCPPSX72.

▶ **Contractors Watching**—Manufacturers and suppliers doing business with AMC, many of them stymied in past efforts to be listed to receive invitations to bid, are watching the system with interest and hope.

Persons familiar with the situation at Dayton say that thousands of manufacturers who visited Wright Field during the past year or so were unsuccessful in their attempts to get on invitation-to-bid lists because of the old system and shortage of help to make it operate.

The small staff of a dozen that has been handling the supply lists is about 10,000 behind on the forms filled out by visitors wishing to bid.

▶ **Mechanization**—Part of the modernization plan involves use of machines to keep the Air Force procurement system up to date. Mechanization has been worked out with the IBM Corp. which has been studying the problem for about six months at the instigation of Lt. Col. F. J. Higgins, head of the Services Section.

The machines will be used for rapid sorting of potential suppliers' cards, expediting the processing of the lists when bids on a given item are to be called for.

Here is how the new system will work:

Air Force sends out the catalogs, compiled from existing source of supply records by property classifications, to manufacturers who previously have shown interest in receiving invitations to bid.

The manufacturer who gets a catalog checks the item or items for which he wants to be considered a potential source of supply. He writes his company's name and address on the catalog cover and mails the whole thing back to the AMC's commanding general at Wright-Patterson AFB.

▶ **Lists Set Up**—There the items checked will be set up on the IBM cards. After that, the manufacturer remains on the list for those items unless he fails to respond to an invitation for bid.

All cards in each classification will be together. When run through the machine, they will be sorted automatically so that those of suppliers of the specific item wanted will be segregated. From these the list of bidders will be readily available.

Thousands of the catalogs have been

HEADQUARTERS
AIR MATERIEL COMMAND
WRIGHT-PATTERSON AIR FORCE BASE
DAYTON, OHIO

IN REPLY ADDRESS BOTH COMMUNICATION AND ENVELOPE TO COMMANDING GENERAL, AIR MATERIEL COMMAND, ATTENTION FOLLOWING OFFICE SYMBOL:
MCPPXS72

SUBJECT: Sources of Supply List

1. Procurement regulations prescribe that each procuring service will maintain a current sources of supply list containing the names and addresses of persons or firms to whom invitations for bid should be distributed. Changes in industry resulting from the war and the post war reconversion period have largely obsoleted the list at this command. To effect the necessary modernization a catalogue has been prepared listing in considerable detail items or groups of items which the Air Force procures. For ease in handling, the catalogue is broken into various sections, the index to which is inclosed for your information.

2. The records of this Headquarters show that you have previously indicated a desire to receive invitations on the general class of items in the inclosed catalogues. These catalogues are to be used by potential sources for the purpose of listing the items you are in a position to manufacture or supply. Indiscriminate marking of other items should be avoided. The instructions contained in the foreword of each catalogue must be followed explicitly.

3. Compilation of the information obtained from the catalogues returned will establish the potential source of supply list for the Procurement Division, Headquarters, AMC. Contractors so listed will be invited to bid on all advertised procurements. The sources of supply list will be maintained current by removing those potential sources who fail without reason to answer inquiries emanating from this Headquarters.

4. The catalogues include many qualified products, the specifications for which require qualification tests as a condition precedent to the award of contracts. Numerous products are presently being considered for placement in this category. Accordingly manufacturers will be notified and furnished specifications of such products in order that they may submit their products for tests and become qualified sources. Notwithstanding the fact that manufacturers may indicate a desire to be considered a potential source of supply on qualified products, this Headquarters reserves the right to solicit bids from only the sources having qualified products, as the time element seldom permits a bidder to obtain approval of a product after issuance of the invitation for bid.

5. The cooperation of potential bidders in this matter will be of mutual benefit and will serve to improve the procurement system of the United States Air Force. To expedite the implementation of this new system, a reply is requested on or before 15 August 1949.

FOR THE COMMANDING GENERAL:

Incls:
Catalogue Index
Appropriate Catalogues
Return Envelope

H. A. SHEPARD
Brigadier General, USAF
Chief, Procurement Division

AMC'S 5-POINT LETTER tells contractors about new catalog system.

Index of New AMC Catalogs

New catalogs sent Air Force suppliers recently by the Air Materiel Command are listed below. Copies may be obtained from the Commanding General, Air Materiel Command, Wright-Patterson Air Force Base, Dayton, Ohio. Attention: MCPPXS72.

CLASS 03—AIRCRAFT AND ENGINE ACCESSORIES AND MAIN PARTS.

Propellers; wheels; brakes; skis; floats; electrical equipment; carburetors; turbo-superchargers; miscellaneous aircraft accessories, i. e., glider towing and pickup, controls, cushions, cylinders-CO_2 and parts for automatic airborne fire fighting installations, equipment-cargo tie-down, heaters, tubes; hydraulic struts and actuating cylinders; ignition systems; fuel, hydraulic, vacuum, oil and de-icer systems; miscellaneous aircraft engine accessories, i. e., batteries, controls, markers, mounts, quadrants, breathing oxygen equipment; auxiliary fuel tanks; transmission systems—rotary wing aircraft, and related parts.

CLASS 04—AIRCRAFT HARDWARE, RUBBER MATERIALS AND BEARINGS.

Bolts, cable, fasteners, fittings, gaskets, insulators, casings and inner tubes, anti-friction bearings, and related parts.

CLASS 05—AIRCRAFT INSTRUMENTS.

Navigation; flight; engine instruments; instrument maintenance parts; automatic pilots and gyro control mechanisms; miscellaneous aircraft instruments, i. e., ammeters, gages, indicators, transmitters, volt-ammeters, voltmeters, and related parts.

CLASS 06—FUELS, LUBRICANTS AND GASES.

Aircraft engine fuels and crankcase lubricating oils; compound, i. e., fluids, greases, and oils.

CLASS 07—DOPES, PAINTS, CLEANING COMPOUNDS.

Cements; enamels; glue; primers; protective coatings; removers; soap; and wax.

CLASS 08—COMMERCIAL ELECTRICAL EQUIPMENT AND SUPPLIES.

Electric equipment and parts; supplies, i. e., batteries, boxes, condensers, fuses, lamps, resistors. Rheostats, solenoids, tape, terminals, tubing and wire; permanent and semi-permanent night light equipment, and related parts.

CLASS 09—AERIAL TARGETS AND GLIDERS.

Aerial targets, man-carrying power driven; gliders; and related parts.

CLASS 10—PHOTOGRAPHIC EQUIPMENT AND SUPPLIES.

Aerial and ground equipment; photographic supplies; i. e., albums, cans, carbon, lamps, magazines, paper, tissue, reels; motion picture equipment; and related parts.

CLASS 11—AIRCRAFT ARMAMENT.

Bombing, and gunnery equipment; remote control turrets; guided missiles; and related parts.

CLASS 12—FUEL AND OIL HANDLING EQUIPMENT.

Fuel units; funnels; hose; measures; pumps; segregators; tanks; and related parts.

CLASS 13—SPECIAL CLOTHING AND PERSONAL EQUIPMENT.

Bags; blankets; cases; gloves; goggles; masks; parachutes; suits; vests; respirators and related parts.

CLASS 14—PREFABRICATED HANGARS AND BUILDINGS.

Related parts.

CLASS 16—COMMUNICATIONS EQUIPMENT.

Airborne communications equipment; ground radio equipment; ground radar equipment; airborne installation parts for radar and communication equipment; radio and radar maintenance parts; radio crystals; meterorological equipment; and related parts.

CLASS 17—SHIP AND WAREHOUSE MACHINERY, TOOLS AND EQUIPMENT.

Powered tools; mechanic's nonpowered hand tools; laboratory and shop test and inspection equipment; assemblies tool kits; production tooling acquired by the AF from contractors; and related parts.

CLASS 18—SPECIAL TOOLS AND EQUIPMENT AND RELATED PARTS.

CLASS 19—GROUND SERVICING, VEHICLES MARINE AND MOTORIZED EQUIPMENT.

Flying field and hangar equipment; AF special purpose and special equipment vehicles and self-propelled materials-handling vehicles; maintenance parts; and related parts.

CLASS 20—AERIAL DELIVERY EQUIPMENT, PAULINS AND PROTECTIVE COVERS.

Covers—aircraft, bombsight, cockpit, engine, nose, propeller, turret, wing; parachutes and sling assemblies; cargo. Walkways—aircraft wing and fuselage; and related parts.

CLASS 21—CORDAGE, LEATHER, AND FABRICS.

Cloth; felt; cord; linoleum; tape; thread; twine; and webbing.

CLASS 22—LUMBER AND LUMBER PRODUCTS.

Cork; plywood; and veneer.

CLASS 23—METALS AND COMPOSITION MATERIALS.

Ferrous and non-ferrous; composition materials, i. e., fiber, glass, and plastics.

CLASS 24—CHEMICALS.

Acids; alcohol; dehydrating agents; methylene dichloride; solvents; welding flux.

CLASS 25—OFFICE EQUIPMENT AND SUPPLIES.

CLASS 26—SCHOOL EQUIPMENT.

CLASS 28—INSTRUCTIONAL EQUIPMENT AND TRAINING AIDS

Instrument flying, landing, navigation, bombing, gunnery, identification, radar, and radio trainers; and related parts.

CLASS 29—HARDWARE AND MISCELLANEOUS SUPPLIES.

Builders, cabinet, and general hardware; miscellaneous supplies, i. e., abrasives, paste, belts, brushes, seals, wood, steel, aluminum and glass.

CLASS 30—BLANK FORMS, PUBLICATIONS, DRAWINGS AND TRAINING FILMS.

Technical orders and other publications; drawings and micro films; training films; posters; charts; weight and balance; and decalcomanias.

CLASS 99—MISCELLANEOUS ITEMS AND EQUIPMENT.

Printing press; refrigerators; stoves; gym equipment; chaplains' supplies; flag standards; mowers; boilers; trays; dental, medical, and optical supplies.

sent out, and returns are coming in. Processing of the cards will follow.

Two active categories are not listed among the catalogs distributed. These are 01, for airframe and airframe parts, and 02, for engines and engine spare parts. "Air Force knows pretty well who builds the airframes and engines," was one comment.

► **Explanatory Letter**—Brig. Gen. H. A. Shepard, chief of USAF's Procurement Division, stated in a letter distributed with the catalogs: "Changes in industry resulting from the war and the postwar reconversion period have largely obsoleted the list at this command."

He cautioned against "indiscriminate marking" of items the catalog recipient was not in position to make or supply. He made the point, too, that the catalogs included many products requiring

CATALOG COVER . . . typical of 27

qualification tests before the award of contracts.

"Numerous products are presently being considered for placement in this category," Shepard stated, and manufacturers will be notified so they can submit such products for tests "and become qualified sources."

▶ **Right Reserved**—AMC headquarters, he cautioned, reserved the right to solicit bids from only sources having qualified products, "as the time element seldom permits a bidder to obtain approval of a product after issuance of the invitation for bid."

While the first step in the new system—the printing and distribution of the catalogs to be marked—is the only one that has been completed, other moves in what Shepard calls the "necessary modernization" are to follow swiftly. AMC urged the cooperation of potential bidders "to expedite the implementation of this new system."

Wright-Patterson handles virtually all Air Force procurement of items carried in stock. Other bases, however are authorized to buy items not carried.

Oil Screens Changed

Pan American Airways has replaced oil pump idler gears, oil screens and by-pass valves on the Pratt & Whitney R-4360 engines of the Boeing Stratocruisers, following engine failure which caused a Stratocruiser to lose a propeller and return to Shannon (AVIATION WEEK July 18). Service was not interrupted.

Pan Am described the change in idler gears as an extra precaution, replacing gears which might have been subjected to strain from excessive oil back pressures. Bronze idler gear shafts were replaced by steel parts.

Oil strainers, which have clogged and sometimes collapsed from carbon in the oil, have been replaced with non-collapsible units of 4½ times greater capacity. Oil screen bypass valves also have been replaced with parts having greater capacity.

It has been reported that old by-pass valves were too small to handle full oil pump output after screens became completely clogged. Although enough oil was passed through to lubricate the engine, the restriction caused by the small valve built up back pressure in the oil pump.

Other airlines using Stratocruisers also have made these changes which were ordered by Pratt & Whitney after study of the engine failure.

B-36 Probe

Van Zandt criticizes congressional delay in bomber inquiry.

While waiting for the postponed B-36 bomber investigation to start last week, Rep. James Van Zandt (R., Pa.) took occasion to issue a second blast on the impending bomber probe, in a House floor speech.

Meanwhile Chairman Carl Vinson (D., Ga.) of the House Armed Services Committee indicated he hoped to start public hearings on the bomber inquiry within two weeks from the originally scheduled date of July 26.

Van Zandt used the recent involvement of two army officers—Maj. Gen. Herman Feldman and Maj. Gen. Alden Waitt—with so-called "five percenters" to re-focus attention on the impending B-36 probe.

He declared:

"It would be disturbing enough if the only black cloud hovering over the Pentagon were this scandal involving two major generals. It is far more disturbing when ugly rumors, which have been aired in the press for months, and which if verified, would amount to a major scandal, involve their superiors, the Secretary of Defense, Louis Johnson, and the Secretary for Air, Stuart Symington. High-ranking officers though they be, Generals Feldman and Waitt are mere underlings by comparison with Johnson and Symington."

After commending a prompt Senate investigation of "five percenters," Van Zandt questioned why Congress balked so long at investigating USAF's B-36 program. "Ugly rumors" involving Johnson and Symington were rampant in Washington and published in the press since the beginning of the year, he said.

"But, what happened? Nothing happened. No action was taken by any committee of the House or by any individual member"—despite the fact that Speaker of the House Sam Rayburn (D., Tex.), House Majority Leader John McCormack (D., Mass.), Vinson, Chairman Millard Tydings (D., Md.) of the Senate Armed Services Committee, "all are reported to have heard the rumors and reports affecting a vital arm of our national defense."

The investigation—which has since been broadened into a survey of all aspects of the Naval Aviation versus Air Force issue, including cancellation of the Navy's 65,000-ton supercarrier—was touched off by the Pennsylvanian, a Naval Reserve captain. In a floor speech a month ago, he pointed to "ugly rumors" that Secretary of Defense Louis Johnson, a former director of Consolidated Vultee Aircraft Corp., influenced the USAF decision to concentrate procurement on the Convair B-36 bomber.

Van Zandt concluded his speech:

"Under our laws a man is presumed innocent until he is proven guilty. Mr. Johnson, Mr. Symington . . . are entitled to the traditional benefit of doubt until and unless they are shown to be otherwise by the evidence. I shall reserve judgment and commend a similar attitude to my colleagues."

AOA Strike Ends As Talks Go On

American Overseas Airlines was back on flying schedule last week after a breakdown in three-month-old negotiations caused a two-day strike by 65 radio operators, members of the Flight Communication Officers Assn. All flights had to be cancelled during the strike.

Both sides agreed to begin new discussions after flights were resumed.

At issue are these union demands:

- **Additional severance pay** regardless of the reason for termination and irrespective of the length of service.
- **An increase** in wages.
- **Flight time credit** for all dead-heading time.
- **Elimination** of the present provision regarding management direction.
- **Assurance** that no communications officers would be separately based at certain overseas stations.
- **Right** of the association to approve schedules before they could be made effective.
- **Reduction** in working time.

Harold R. Harris, AOA vice-president and general manager, said the company had made these offers:

- **Additional severance pay** based on length of service, if termination was due to the elimination of flight communication officers from the crew.
- **An increase** in wages.
- **A revision** of overtime provisions.
- **A provision** which would give effect to dead-heading credit presently authorized.

Proposed AF Budget Cut Draws House Fire

58-group proponents plan battle if Senate approves committee's $800 million slash.

House military leaders last week prepared to challenge the Senate Appropriations Committee's drastic slash in USAF budget for the coming year.

The Senate Committee cut of $799,822,000 if finalized would reduce USAF to only 48 groups. This is the size recommended by the Administration with endorsements from Defense Secretary Louis Johnson and Air Force Secretary W. Stuart Symington.

▶ **Senate Approval**—Preliminary indications were that the Senate would approve its committee's action, although not before Sen. Lister Hill (D., Ala.) and some other Air Force adherents present objections.

Major House blasts on the measure are expected to be detonated at the House-Senate conference committee on adjusting differences between the House-approved 58-group Air Force program and the Senate's recommendations if they follow the Senate committee report. The House voted 271 to 1 for the 58-group Air Force last April.

▶ **Minimum Program**—Rep. George Mahon (D., Tex.), chairman of the House appropriations subcommittee on the armed services, told AVIATION WEEK:

"The Air Force program approved by the House for the next year is a minimum for national defense. The United States cannot 'afford' a smaller Air Force. I recognize that the national government is lapsing into deficit financing, but it would be too costly to cut Air Force expenditures."

Chairman Carl Vinson (D., Ga.) of the House Armed Services Committee is expected to add his potent opposition to the USAF fund slash.

▶ **Minority Backing**—Minority support in the House for backing up its original 58-group plan was indicated when Rep. Carl Hinshaw (R., Calif.) called upon the House to fight for its version of the USAF appropriation, and cited recent reports on Russian airpower as a danger signal.

"Does the ever-growing Red might in the Far East encourage reductions? Are we completely confident that the cold war is over in Europe?" Hinshaw asked in a House speech.

▶ **Navy Budget**—The Senate Appropriations Committee accepted the $1,618,667,000 Naval Aviation budget—$1,042,121,000 cash and $576,667,000 contract authorization—recommended by the Budget Bureau and approved by the House. It endorsed a $76,530,000 authorization for the Bureau of Ships for conversion of two Essex-class aircraft carriers to accommodate modern-type planes, as a substitute program for the 65,000-ton carrier United States, recently cancelled by Johnson.

▶ **Air Force Cuts**—The $5,415,887,000 USAF budget approved by the Senate committee compared with the $6,215,709,000 passed by the House and the $5,465,887,000 recommended by the Budget Bureau.

The Senate Committee's figure included $4,000,887,000 cash and $1,415,000,000 contract authorization. This was a reduction of $222,067,000 cash and $577,755,000 contract authorization from the House figure, which included $4,222,954,000 cash and $1,992,755,000 contract authorization. It was an arbitrary cut of $50,000,000—$33,000,000 cash and $17,000,000 contract authorization—from the Budget Bureau figure, to be applied by the Secretary for Air.

▶ **Desk Pilots**—The committee suggested that the saving might be effected by economies on flying by desk officers, both in connection with duty and in order to qualify for flight pay. It objected that flying of this type—aside from the flight pay involved—has been estimated as high as $200,000,000 a year.

▶ **Aircraft & Totals**—Funds approved by the Senate committee would provide for a total procurement of 2512 aircraft, or 34 million airframe pounds. This would include 1669 USAF (25 million airframe pounds) and 843 Naval aircraft (9 million airframe pounds). The House provided for 2550 USAF aircraft, or 41.8 airframe pounds, and the 843 Naval aircraft.

Following is a breakdown of the main USAF allocations approved by the Senate Committee:

- **Aircraft procurement,** $2,515,000,000—$1,100,000,000 cash and $1,415,000,000 contract authorization. (Compares with the $1,100,000,000 cash and $1,992,755,000 contract authorization allowed by the House.)
- **Special procurement,** $126,139,000. (Compares with the $134,477,000 provided by the House.)
- **Maintenance and operations,** $1,068,864,000. (This was $130,928,000 below the $1,199,792,000 approved by the House.)
- **Military personnel,** $1,201,000,000. (This was $62,623,000 below the $1,263,623,000 approved by the House.)
- **Research and development,** $215,000,000. (The House approved $233,000,000.)
- **Administration,** $58,425,000. (This was $1,445,000 less than the $59,870,000 recommended by the House.)

▶ **Reserve Budget**—Budget Bureau recommendations of $82,000,000 for the Air Force Reserve, $11,700,000 for the Air Reserve Officers' Training Corps, and $115,000,000 for the Air National Guard were accepted by both the House and the Senate group.

Navy BuAer's $1,042,121,000 budget—recommended by the Budget Bureau and approved by both the House and the Senate committee— includes: $523,070,000 cash and $576,546,000 contract authorization for aircraft procurement; $515,585,000 for operations; and $3,466,000 for salaries.

SEC Report

The aircraft industry's sales volume for the first quarter stood at $335,175,000—$109,078,000 over the $226,097,000 volume for the same period last year, according to a report by the Securities Exchange Commission.

SEC reported first quarter net sales (with first quarter 1948 sales in parenthesis) as follows:

Beech Aircraft Corp., $4,540,000 ($6,150,000); Bell Aircraft Corp., $3,225,000 ($2,238,000); Bellanca Aircraft Corp, $171,000 ($73,000); Boeing Airplane Co., $55,195,000 ($19,303,000); Cessna Aircraft Co., $4,452,000 ($3,166,000); Consolidated Vultee Aircraft Corp., $50,186,000 ($5,363,000); Curtiss-Wright Corp., $27,671,000 ($23,092,000); Douglas Aircraft Co., $26,000,000 ($15,252,000); Fairchild Engine and Airplane Corp., $3,947,000 ($7,390,000); Grumman Aircraft Engineering Corp., $7,900,000 ($8,060,000); Lockheed Aircraft Corp., $32,169,000 ($32,835,000); Glenn L. Martin Co., $12,273,000 ($10,977,000); North American Aviation, Inc., $31,569,000 ($14,488,000); Northrop Aircraft, Inc., $7,420,000 ($6,548,000); Piper Aircraft Corp., $780,000 ($489,000); Republic Aviation Corp., $9,706,000 ($14,375,000); Ryan Aeronautical Co., $3,122,000 ($1,356,000); United Aircraft Corp., $54,849,000 ($54,942,000).

SEC reported first quarter sales for aircraft equipment manufacturing (with first quarter 1948 sales in parenthesis) as follows:

Air Associates, Inc., $1,589,000 ($1,525,000); Breeze Corp., $1,165,000 ($1,466,000); Garrett Corp., $4,392,000 ($3,543,000); Menasco Manufacturers Co., $375,000 ($355,000); Solar Aircraft Co., $4,398,000 ($3,237,000); United Aircraft Products, Inc., $537,000 ($552,000); Wright Aeronautical Corp., $15,330,000 ($11,891,000).

States	No. Projects	Sponsor's Funds	Federal Funds	Total Funds
Alabama	1	$482,500	$420,500	$903,000
Arizona	4	484,473	752,100	1,236,573
Arkansas	7	462,363	431,363	893,726
California	21	2,288,622	2,365,193	4,653,815
Colorado	1	364,493	416,507	781,000
Connecticut	2	170,000	170,000	340,000
Florida	5	756,750	756,250	1,513,000
Georgia	6	999,510	895,510	1,895,020
Illinois	6	4,293,960	2,062,300	6,356,260
Indiana	11	980,000	970,000	1,950,000
Iowa	13	648,780	633,780	1,282,560
Kansas	15	571,325	506,275	1,077,600
Kentucky	6	448,000	418,000	866,000
Louisiana	10	709,100	695,350	1,404,450
Maryland	2	530,000	530,000	1,060,000
Massachusetts	5	804,000	804,000	1,608,000
Michigan	7	1,771,836	1,249,000	3,020,836
Minnesota	12	1,182,000	1,077,000	2,259,000
Missouri	7	684,527	664,527	1,349,054
Nebraska	31	665,126	561,299	1,226,425
New Jersey	3	585,000	585,000	1,170,000
New York	10	2,684,000	2,650,000	5,334,000
North Carolina	5	181,575	143,575	325,150
Ohio	10	1,212,500	881,000	2,093,500
Oklahoma	19	535,060	544,359	1,079,419
Oregon	3	349,942	444,381	794,323
Pennsylvania	8	6,199,507	2,004,110	8,203,617
Rhode Island	1	570,000	550,000	1,120,000
South Carolina	1	179,000	171,000	350,000
South Dakota	7	140,144	155,685	295,829
Tennessee	5	547,375	536,125	1,083,500
Texas	25	1,992,380	1,738,780	3,731,160
Utah	5	236,770	376,607	613,377
Vermont	3	57,500	57,500	115,000
Virginia	4	645,000	645,000	1,290,000
Washington	15	276,884	278,316	555,200
West Virginia	3	351,500	345,000	696,500
Wisconsin	10	929,500	826,500	1,756,000
Territory of Hawaii	2	229,000	229,000	458,000
Puerto Rico	1	200,000	200,000	400,000
Virgin Islands	2	32,750	99,875	132,625
TOTALS	314	$37,432,752	$29,840,767	$67,273,519

CAA's 1950 Airport Program

Civil Aeronautics Administration's Federal Aid Airport Program will undertake 314 projects involving $29,840,767 in Federal funds during fiscal 1950. Local sponsors will provide matching funds totaling $37,432,752.

The 314 projects include 172 Class I, II and III airports; 141 Class IV or larger airports; and one seaplane base.

Eighteen airports throughout the country will receive over $1 million in total funds, from both Federal and local or state sources. They include: Phoenix ($1,083,020), Los Angeles Municipal ($1,745,000), San Francisco Municipal ($1,663,043), Miami International ($1,000,000), Atlanta ($1,200,000), Chicago Orchard ($4,731,660), Baltimore Friendship ($1,000,000), Worcester, Mass. Municipal ($1,200,000), Detroit Wayne Major ($2,514,336), Wold Chamberlain ($1,400,000), St. Louis Lambert ($1,000,000), Newark Municipal ($1,000,000), New York International ($1,700,000), Philadelphia International ($2,057,900), Greater Pittsburgh ($4,501,242), Providence, R. I. ($1,120,000), and Milwaukee's General Mitchell ($1,025,000).

A total of $39.5 million has been appropriated for airport work during fiscal 1950.

Of this, $3 million is for administrative purposes, $500,000 for work in the Territories, $27 million apportioned among the states under a formula provided by law and $9 million remains in a discretionary fund that may be used by CAA Administrator Delos Rentzel regardless of state boundaries.

Coach Study

CAB survey reveals what low-fare service has meant to airlines.

Impact of air coach service on the operations of five certificated domestic airlines offering the cut-rate, off-hour flights was disclosed in a comprehensive 50-page report made public by the Civil Aeronautics Board last week.

The study stemmed from detailed cross-classification of questionnaires filled out during May by 7000 passengers on 252 coach flights and 30,000 passengers on 1120 paralleling regular-fare flights. The data will be a major factor in CAB's forthcoming decision on how far tourist-class services should be permitted to expand (AVIATION WEEK, July 25).

Supplemental financial and traffic data was incorporated into the study of questionnaire returns from Capital Airlines, Mid-Continent Airlines, Continental Air Lines, TWA and Northwest Airlines.

► **Indications**—CAB announced no conclusions from its air coach study. But these facts stood out:

1. About two-thirds of the passengers going air coach would not have ridden the airlines at all if air coach were not available.

2. Air coach as early as last spring accounted for almost one-quarter of Capital Airlines' total passenger miles and over one-fifth of Northwest's.

3. Passenger load factors on four-cents-a-mile coach flights operated by Capital, Northwest and TWA during April and May far exceeded load factors on these carriers' regular six-cents-a-mile schedules. Mid-Continent and Continental apparently were having trouble developing traffic for the new service.

4. About 20.9 percent of the air coach passengers surveyed were making their first airline flight against 10.8 percent first-flighters on regular-fare schedules.

• **Capital Airlines**, which claims to handle more air coach passenger than all other scheduled U. S. carriers combined, reported that 23.4 percent of its total passenger miles and 17 percent of its passenger revenues during April and May, 1949, came from its tourist-type service. The company began operating its low-fare DC-4 "Nighthawk" flights between New York and Chicago last Nov. 4; started air coach service between New York and the Twin Cities Mar. 24; and between Washington and Chicago on Apr. 1.

• **Northwest** said 20.7 percent of its total passenger miles and 15 percent of

its passenger revenues were derived from air coach during the two-month survey period. NWA started its low-fare DC-4 service between New York and Seattle on Mar. 24.

• **Continental** disclosed that about 5 percent of its passenger miles and 3.6 percent of its overall revenues were from air coach services in April and May. CAL's DC-3s have been making four-cents-a-mile flights between Kansas City and Denver since Feb. 17.

• **TWA** reported 4.1 percent of its passenger miles and 2.8 percent of its passenger revenues came from air coach in the survey months. The company has been offering DC-3 coach flights between Kansas City and Los Angeles since Feb. 6. Its New York-Chicago Stratoliner service at four cents a mile was not started until May 31 and did not figure in the study.

• **Mid-Continent,** which operates coach flights from Kansas City to Minneapolis-St. Paul, said 4 percent of its passenger miles and 2.8 percent of its passenger revenues were from the low-fare service during April and May. MCA's coach trips started on Mar. 1.

With the exception of Capital's New York-Chicago "Nighthawk," all of the coach services had operated less than two months prior to the CAB survey. Even so, combined passenger load factors for three of the five carriers' tourist-class services were substantially higher than load factors on regular flights.

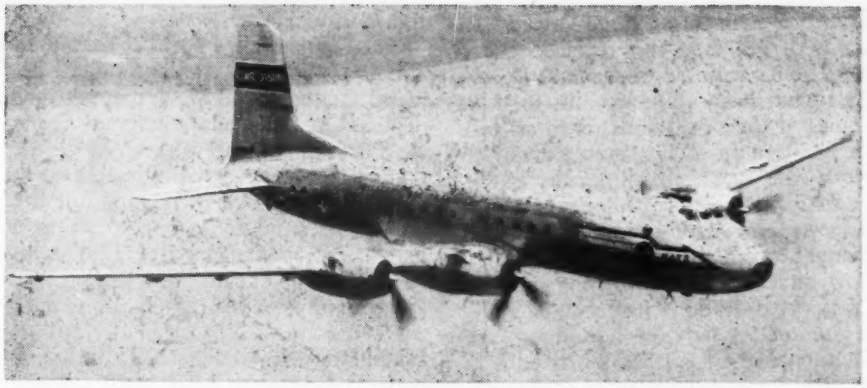
▶ **Load Factors Compared**—Northwest's April-May passenger load factor on air coaches was 83.9 percent against 55.4 percent on regular services. Capital's coach load factor was 75.2 percent against 50.6 percent; TWA's 74.2 percent against 61.5 percent; Mid-Continent's 53.8 percent against 59.2 percent; and Continental's 39.8 percent against 40.3 percent.

The four-cents-a-mile coach flights operated by the certificated airlines generally leave their terminals between 10 pm. and 3 am. Usual reservations procedures and meals are eliminated.

New Pitch Control

Sikorsky Aircraft has announced a hydraulic cyclic pitch control which permits finger-tip control instead of the steady grip formerly required on the stick. The new device has already demonstrated its ability to reduce pilot fatigue in many hours of demonstration flying at both Naval and Air Force installations.

The device is operated by a 1/50th hp. hydraulic pump and can be easily installed on present Sikorsky helicopters by means of a complete kit available for field installation. The new control is scheduled for installation on production aircraft in the near future.



ON TRANSATLANTIC DUTY one Douglas C-74 does the job of three C-54s cargowise, while . . .

. . . PASSENGERWISE the Lockheed C-121A's speed and payload makes it worth two C-54s.

MATS Proves Unification Case

Although some traditions hold on, remarkable progress has been made in consolidation; air coach tried.

By Robert Hotz

After a year's operation, Military Air Transport Service is the prize exhibit in the unification showcase.

MATS offers the spectacle of U. S. Air Force and Naval airmen working together with close to a minimum of friction doing a job that is by all standards available for comparison both more efficient and less expensive than the sum total of the two organizations MATS superseded—Air Transport Command and Naval Air Transport Service.

There are still spheres in MATS where USAF and Navy policy clash. For example, USAF views its flight control system primarily as an advisory service; Navy regards it as a means of enforcing rigid air discipline and control from the ground. USAF trains crewmen for specific functions; Navy prefers its crewmen to be all-around experts. Navy wears black ties on days when USAF personnel go tie-less. MATS personnel are still disciplined under the separate legal codes of their respective services.

On the credit side of the ledger are more substantial items. The bare statistics are:

• **620 Multi-engine transports** assigned compared with 497 a year ago.

• **49,300 personnel assigned** compared to 54,595 a year ago. Latest breakdown shows 17,400 USAF and 3000 Navy personnel in MATS plus 28,900 USAF personnel in MATS service commands (Air Rescue; Airways Communications; Air Weather Service; Base Commands, etc.)

• **177 million ton miles flown** during the first year of MATS operations.

Among the solid achievements of MATS transport division are:

• **Consolidation of major terminal facilities** where USAF and Navy formerly maintained separate air terminal facilities.

Biggest consolidations were at Washington National, Hawaii and San Francisco. MATS staff at Washington National is now slightly smaller than the total of ATC and NATS personnel formerly assigned there and handles a slightly larger volume of air traffic.

• **Establishment of a single air bill** and priority system for all three services. In terms of red tape this replaced the 7 to 9 copies required of separate USAF, Army and Navy shipping bills to three copies of the new standardized air bill. In addition to saving time and paperwork, the new bill eliminates bottlenecks in inter-service shipments.

• **Development of a single air traffic manual** for all three services. Project is now under way to develop a standard transport operations manual.

• **Use of cycled reconditioning and maintenance** by civilian contractors to replace the expensive and cumbersome Air Materiel Command depot system (AVIATION WEEK July 18), and get longer life out of its transport fleet.

• **Development of the first operational experience** on long range postwar strategic air transport types (Douglas C-74, Boeing C-97, and Lockheed C-121A).

• **Development of specialized ground handling equipment** for large transport planes. As a result of MATS studies, ground handling equipment is now included in the original procurement package for new transports. Previously nobody worried about the ground equipment until the transports were delivered.

▶ **Airlift Influence**—MATS first year was dominated by the influence of the Berlin airlift which began just 26 days after MATS was officially activated on June 1, 1948. The great majority of MATS transport activity has been in support of the airlift and 314 of its 352 assigned C-54 transports are actually operating in Germany. Despite this tremendous drain MATS dropped only two of its previous transport routes—a run from Puerto Rico to Rio De Janeiro; and another from Schemya in the Aleutians to Tokyo.

In addition to airlift support, MATS furnished special airlift for the Navy's Mediterranean Fleet and for the scattered net work of Arctic weather stations. Air support of occupation forces in Japan and the Navy's Pacific Fleet was maintained at 75 percent of the pre-airlift scale through use of Navy flying boats, Marine C-54s and Far Eastern Air Force transports all operating under MATS direction. Berlin Airlift C-54s in transit to maintenance depots in the United States were used to keep up the military transport quota within the United States.

▶ **Big Transports**—Perhaps MATS' most interesting experience of its first year was the introduction of three new types of long range strategic transports. MATS commander Maj. Gen. L. S. Kuter is particularly pleased with the proving out of these types. He believes that the trend toward larger military transports will continue to the point where ground handling becomes too cumbersome to pay off in increased transport efficiency.

The Douglas C-74 fleet has been used almost entirely on hauling engines between Germany and U. S. maintenance depots. On this operation seven C-74s have been doing the work of 21 C-54s. Gen. Kuter believes considerable work remains to be done in proving out the C-74 on general cargo but points to a haul of 67 passengers and 12,000 lb. of cargo from Panama to Mobile, Ala., as an example of what can be done with a C-74.

▶ **Military Air Coach**—The six Lockheed C-121As are being used entirely for personnel transport across the Atlantic. Combination of greater speed and capacity have proved the C-121A to equal two C-54s on the trans-Atlantic run. MATS has put the first large aircoach into operation in the Pacific with a Boeing C-97-B equipped to handle 85 passengers.

In its work with the large transports MATS has also worked out new tables for spare parts procurement based on actual experience rather than theory. New transports are now purchased with a supplementary contract for keeping the plane in spares for its anticipated life.

For the Lockheed C-121As MATS has worked out an experimental arrangement whereby anybody in MATS that needs C-121A spare parts can order them directly from Lockheed and MATS is billed. This eliminates a mountain of military red tape in requisitioning, and speeds the parts to where they are most needed, instead of gathering dust in some military warehouse.

U. S. To Ask Airline for Japan

Intra-island service likely to be owned and operated jointly by foreign carriers now serving Japan.

(McGraw-Hill World News)

TOKYO—Soon the U. S. can be expected to ask the Far Eastern Commission (FEC) to approve the creation of an internal commercial airline for Japan.

Officials of GHQ, Supreme Commander for the Allied Powers (SCAP), refuse to discuss the problem or to answer questions regarding internal aviation. They state that SCAP is bound by Far Eastern Commission decisions which ban Japanese participation in aeronautical operations or development. Until the FEC approves changes, they claim nothing can be done.

▶ **Necessary Part**—However, there is considerable basis for assuming that SCAP has asked the U. S. to take up the subject in the FEC. SCAP will neither confirm nor deny this. But it states that an internal airline is a necessary part of the transition for peaceful postwar Japan and that it would contribute to the country's economic recovery. SCAP's airline planning study was revised recently for the fourth or fifth time in two years prior to retransmission to Washington.

SCAP may have asked for unilateral U. S. action, but this is doubtful. It would have to premise such a request on the absolute necessity of an internal airline to Japan's economic recovery. This would be difficult to prove.

▶ **Currency Concern**—SCAP's Economic and Scientific Section (ESS) has been more definite in stating that an internal airline is economically justifiable. ESS is concerned about sources of foregin currency revenue with which an airline could meet its necessary external payments for gasoline, pilots, crews, maintenance parts as well as original equipment.

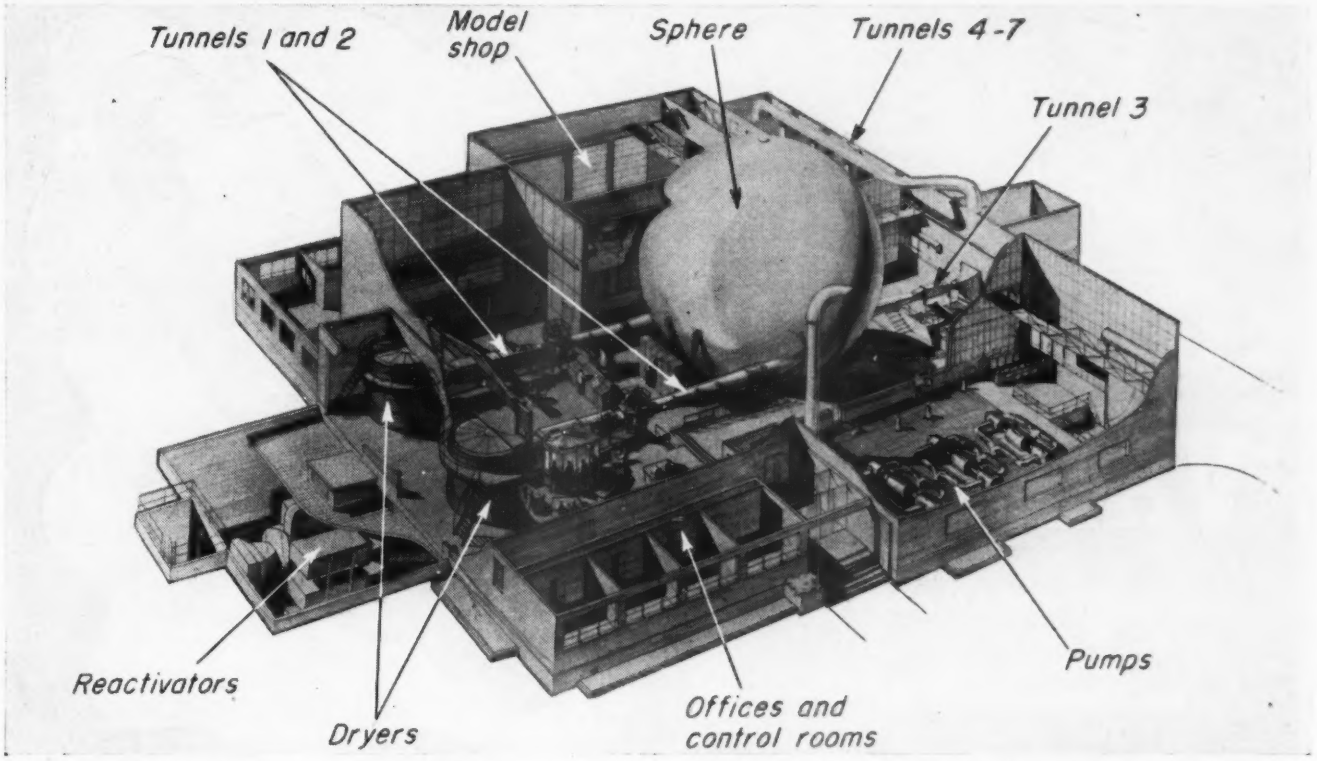
One solution may be to allow purchase of tickets by foreigners only in acceptable foreign currencies (dollars or pounds). Also, international air freight could be billed entirely in foreign currency. Only Japanese passengers and internal cargo tariffs would be listed in yen.

One stumbling block has been discussion as to operators of an internal carrier. Even if the FEC approves an airline, it certainly will ban Japanese operation.

▶ **Foreign Owned**—Answer to this seems to be a joint foreign-owned and managed carrier. Both Pan American World Airways and Northwest Airlines have applied for permission to conduct such an operation. Philippine Air Lines, British Overseas Airways Corp., Cathay Pacific and Trans Ocean have voiced interest in internal operations.

▶ **Joint Company**—As outlined here, a joint stock company would be created, with all airlines certificated to operate into Japan entitled to buy equal shares in the airline. Participants would provide necessary foreign capital to get the line going. It is anticipated that foreign currency earnings from foreign ticket purchases and international air freight would keep the line operating.

Yen income from domestic passengers and cargo would take care of yen expenditures for Japanese ground personnel and construction. Participating companies could not expect any immediate foreign currency earnings but would be entitled to yen income which could be applied to their yen costs of doing business in Japan.



Welded steel, 73,600-cu. ft. vacuum sphere, key component in re-erected Kochel tunnel, draws outside air through test section.

Captured Tunnel Advances U.S. Research

Famed Kochel installation put in operation at Navy's White Oak lab. Feature is low power requirement.

By Robert McLarren

After a venturesome trail extending from the Baltic Sea to Bavaria and across the Atlantic to Maryland, the famed Kochel supersonic wind tunnel is now in full-time operation for the United States Navy.

This nomadic career in itself is a rare tribute to the importance of this unusual but valuable piece of research equipment.

The outstanding attribute of the Kochel tunnel, due to its intermittent operation, is its low power requirement: about 1/13th that of an equivalent tunnel designed for continuous operation.

▶ **Power vs. Speed**—As the new science of supersonic wind tunnel design began to formalize in the late 'thirties, it became increasingly clear that the power required for operation is related to the test section Mach number. Assuming the same test section density, the power required varies directly with the Mach number.

The Mach number obtainable at the test section is determined by the pressure ratio across the section. For example, a test section Mach number of 2.0 will require a pressure ratio of only 2, but a test section Mach number of 4.0 will require a pressure ratio of 10, or five times as much. For Mach numbers higher than 4.0 the determining factor is the availability, rather than the utilization of the required power.

▶ **Ingenuity**—The power problem was serious in Nazi Germany, even before the war. As the armament industry expanded, this problem grew increasingly acute. As a result, German scientists resorted to ingenuity to eliminate the necessity of high power for operation of research equipment.

One of the shrewd ways in which this was accomplished was the use of "blow-down" and "suck-down" spheres in which the required power could be accumulated with a fairly low-powered motor and expended quickly in a high-powered air stream.

▶ **Origin**—The Kochel wind tunnel was originally built at the Peenemünde Proving Ground on the Baltic Sea as a research tool for work on rocket-powered missiles. This station was under the direction of the Army Weapons Office and the V-2 and other Nazi missiles were developed as ordnance equipment for the ground forces as distinct from the Luftwaffe.

Work on the station at Peenemünde was begun in 1939 and the wind tunnel was one of the first items of equipment to be completed. Research work began with the A1 missile and continued up through the A16 missile, the A4 missile eventually reaching production as the notorious V-2 weapon.

This tunnel was also used to develop the design of the "Wasserfall" missile, a supersonic rocket 25 ft. 6 in. long weighing 8400 lb. Constant development work on the wings and empennage of this missile finally produced a design with a neutral point movement of less than 0.03 chord over the whole range of Mach numbers from zero to 2.5, an amazing example of empirical research.

▶ **German Tunnels**—Much has been written in praise and surprise concerning German wartime supersonic wind tunnels, but actually there were only two high Mach number wind tunnels

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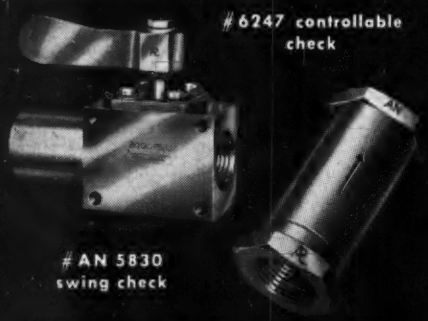

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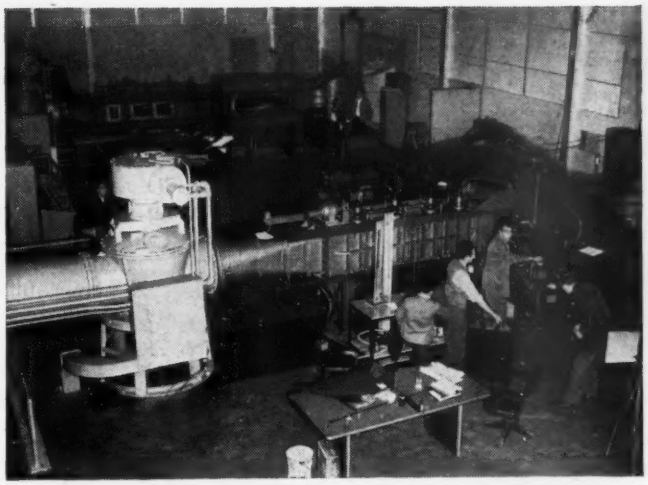
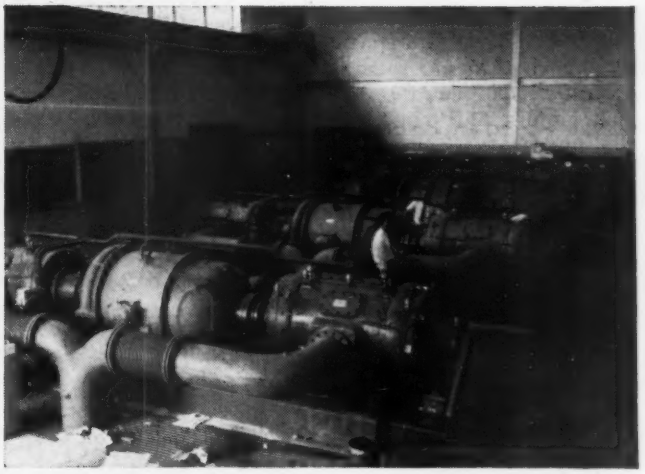




Ingenious ½-ton valve (left), operating in 0.7 sec., connects sphere with test section. Right: Motor and vacuum pump equipment.

which played important roles in the supersonic research program of the Nazis: the pre-war 4.3 x 5.1 in. Mach 3.0 tunnel of the Aerodynamische Versuchsanstalt Göttingen, and the Kochel tunnel.

Both were of the intermittent-operation type with rectangular test sections and open jet design. There were two other supersonic tunnels placed in operation during 1945, far too late to influence design, and the famed Mach 10.0 tunnel was still under construction at Kochel when the war ended.

► **Exodus**—The Kochel tunnel was in full operation through 1940 and 1941, the end of the latter year seeing the final aerodynamic development of the V-2 missile. The first missile was fired in July, 1942, and the first successful launching was made in October, 1942. When photo-reconn aircraft of the Royal Air Force discovered the station at Peenemünde in the summer of 1943 it was far too late for interruption of the V-2 research program. The first RAF raid on the station was in August, 1943, but this caused no interruption of the research and development program.

The British did not know the purpose of the station at the time and it was not until a year later that the importance of the site as a target was determined.

At this time three attacks by the 8th Air Force caused severe damage to the station and the decision was made to transfer the work elsewhere. Production and development of the V-2 missile was transferred to Nordhausen and Bleicherode, the theoretical sections were moved to the vicinity of Garmisch-Partenkirchen and the wind tunnel and aerodynamics work transferred to Kochel, about 25 miles south of Munich. This station was the Wasserbau Versuchsanstalt Kochelsee (WVA) and was in full operation at the time U. S. forces arrived about May 1, 1945.

► **Second Move**—The tunnel was assigned to the U. S. Navy in June, 1945 by decision of the Joint Chiefs of Staff. The Navy Bureau of Ordnance decided to dismantle the tunnel and ship it to the United States and Comdr. H. M. Mott-Smith of BuOrd was assigned to supervise the job. The tunnel was shipped in October, 1945, and the job of modernization and re-erection was begun at the new Naval Ordnance Laboratory, White Oak, Md., in July, 1946, under the direction of Mr. L. C. Fisher.

The contracts for the primary buildings were awarded in July, 1946, but unavoidable delays due to nationwide coal and steel strikes delayed the completion of the installation until July 1, 1948, when air was first blown through the tunnel.

On Nov. 24, 1948, air was blown through the tunnel at Mach 5.18, a record for tunnels of this size. The actual speed in the tunnel was 1575 mph. at a temperature of −377 F. This corresponds to a speed of 3960 mph. under standard sea level conditions.

► **Two-in-One**—The tunnel, as originally operated at Kochel, was actually two identical tunnels 40 x 40 cm. (16 x 16 in.), powered by a single sphere with a capacity of 750 cubic meters (26,500 cu. ft.). It had a maximum operating time of about 15 sec. and a maximum Mach number of 4.4.

Evacuation of the tunnel was accomplished by three 260 kva (350 hp.) motors operating vacuum pumps. (Calculations indicate that continuous operation of the tunnels would require 10,000 kva, whereas intermittent operation only required 780 kva.)

It was decided not to re-install the original riveted sphere and an entirely new welded-steel sphere, 52 ft. in diameter and with a capacity of 73,600 cu. ft. (more than twice that of the original sphere) was erected by the Chicago Bridge and Iron Works.

Other than this, the remainder of the equipment is the same as that used at Kochel, including the motors, test sections, quick-opening valves, and other parts.

► **Operation**—The tunnels are sealed off and the motors pump air out of the sphere until it is evacuated to a 99.5 percent vacuum. The three pumps take about 15 minutes to produce this near-vacuum.

With a missile model installed in one of the tunnels, a quick-opening valve permits air at atmospheric pressure to move from an intake outside the building through the test section and into the vacuum in the sphere. The pressure in the sphere increases to atmospheric in 40-45 secs. and the flow stops.

During this brief time, schlieren apparatus furnishes qualitative data on the flow and recording instrumentation furnishes quantitative data on lift, drag and pitching moment of the missile model.

Meanwhile, the model in the other tunnel is being prepared and, when the sphere has been again evacuated, air is admitted into the other tunnel, while changes in the first tunnel are being made.

► **Equipment**—Each of the three German Siemens electric motors is mounted between two vacuum pumps. Each motor is rated at 360 hp when operated on a 4000 volt, 60 cycle power supply. As these motors were originally designed and operated by the Germans, they were powered by 6000 volts at 50 cycles. However, with this design and U.S. electrical current, they would have run 20 percent overspeed. This was eliminated by installing speed dropping resistors. The motors are simple wound rotor type.

The six Demag pumps are of the positive displacement type using sliding vanes. The pump impeller and the pump case are eccentric and the blades slide in and out of slots in the impeller, centrifugal force causing them to ride

along the surface of the casing during a portion of each revolution. During the remainder of the revolution they are forced back into their slots by the eccentricity between the shaft and case. The motors and pumps are operated continuously.

▶ **Valve Importance**—One of the critical items in the operation is the intermittent-type tunnel is the quick-opening valve. Maximum pressure ratio is obtained across the test section of such a tunnel when the passageway between the vacuum of the sphere and atmospheric pressure is cleared instantaneously. If a slow-opening valve is used, much of this pressure ratio is lost in the process.

One of the finest examples of German ingenuity and skill are the huge Polte valves, which, although weighing ½-ton each, are lifted from their seats, turned 90 deg. and returned to their seats in the astonishing time of just 0.7 sec.

▶ **Low Temperatures**—The high pressure ratios across the test section that characterize high Mach number tunnels involve low densities which, in turn, create extremely low temperatures.

As the air approaches the test section it is first accelerated to sonic speed by a convergent duct. Beyond this throat the duct is divergent to expand the air to supersonic Mach numbers. This expansion takes place at the expense of the heat energy in the air, thereby producing extremely low temperatures. Naturally the speed of sound is greatly reduced and the Mach number for a given flow velocity is increased.

For example, when the velocity of the air into the test section is 1136 mph., the temperature is only –171 F. Since the speed of sound at this temperature is only 568 mph., tunnel conditions are Mach 2.0. When this velocity is increased to 1560 mph. (which, under standard sea level conditions would be a Mach number only slightly over 2.0), the temperature drops to –373 F., at which the speed of sound is only 312 mph. At this velocity, the test section is operating at Mach number 5 conditions.

▶ **Guard Against Condensation**—Because of these extremely low temperatures, the air must be moisture-free to prevent condensation (and, in extreme cases, freezing) as the air passes through the nozzle. Condensation releases heat, which changes the temperature and makes the nozzle the wrong shape to produce the desired Mach number.

The flow of wet air, therefore, is non-uniform in speed along the test section and always at a Mach number lower than is desired. For this reason, the air inlets outside the building are enclosed in large silica gel air-drying units.

▶ **Nozzle Blocks**—The original Kochel nozzle block designs are used in the NOL tunnels. These blocks are designed to produce Mach numbers of: 1.22, 1.56, 1.86, 2.48, 2.92, 3.24 and 4.38 plus a 5.18 set of blocks designed but not used by the Germans. These blocks are carefully chosen to produce the selected Mach number.

Portion of 52-ft. sphere is seen in foreground. Welded plates are 1 1/16 in. thick.

Nozzle blocks may be any convenient length but the throat opening and the shape of the curves must be a single, concise form, which will produce uniform speeds and flow parallel to the axis at all points in the test section of the tunnel.

The original Kochel mount support and balance systems are used. The model is mounted on a "sting" support which, in turn, is bolted to a circular support. The angle of attack of the model is changed by rotating this circular support. The sting support can be either a solid or split type, depending upon the type of test being run.

▶ **Expansion Plans**—Naval Ordnance Laboratory has plans for a substantial expansion of the equipment operated from the sphere and associated pumping equipment over that used at Kochel.

The completed plan contemplates a total of seven tunnels including: (1 & 2) 40 x 40 cm. tunnels—now in operation, (3) an 18 x 18 cm. tunnel, which will be operated continuously from the main sphere by action of the vacuum pumps, which can produce enough suction through the sphere to operate this small tunnel, (4) a 12 x 12 cm. hypersonic tunnel, (5) a 12 x 12 cm. internal aerodynamics tunnel, (6) a 12 x 12 cm. aerophysics tunnel, and (7) a 12 x 12 cm. heat transfer tunnel.

All of these will be fed from a continuous air dryer, the air proceeding through the tunnels to the vacuum pumps. It is anticipated that the hypersonic tunnel will be able to attain velocities greater than 5000 mph. Plans are also under way for eventual continuous operation of the 40 x 40 cm tunnels through the use of special high-capacity Brown-Boveri pumps, now under construction. These pumps will be located in a separate building and be driven by electric motors. NOL scientists are seeking a maximum Mach number of 7.0 with this new equipment, which will operate entirely separate from the vacuum sphere.

▶ **Limitations**—Although substantial important research and test work can be accomplished by the Kochel-type tunnel at a comparatively low expenditure of power, this advantage is gained, naturally, at the cost of something else. First disadvantage is the extremely short time available for actual test, plus the fact that the testing must be interrupted during the time the sphere is evacuated.

Compared to a continuously-operated tunnel, the ratio of useful data to hours expended is considerably lower in the intermittent tunnel.

Another limitation is the fact that the highest pressure available at the inlet to the tunnel is atmospheric pressure, about 15 lb. per sq. in. Evacuation of the tunnel to a near-vacuum produces a pressure ratio across the test section of a maximum of about 14-to-1. Higher pressure ratios can only be obtained by pressure-driven air as in the compressor-driven continuous-type tunnel.

However, within these limitations, the new NOL supersonic tunnel facility is a unique and important addition to the aeronautical research equipment of this country.

New Antenna Scheme

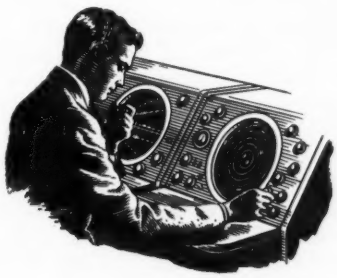
One of the latest developments in the field of zero-drag antennas (AVIATION WEEK, Nov. 29, 1948) is the use of all or part of the plane itself as an antenna, according to the Air Materiel Command, Wright Field.

This technique has been necessitated by the use of low radio frequencies requiring antennas sometimes as large as the aircraft they serve.

It involves isolating a small part of the plane—wing tip, for example—then feeding voltage across a plastic-covered isolating section to excite the entire wing.

Using the same principle in an isolated tail cap, the fuselage also can be energized to act as an antenna.

Another method for energizing the wing is to insert an exciter coil close to it in the fuselage and electrically induce energy over into the wing structure.



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At airports around the world where weather is soupiest and blind landings require a fail-safe, precision instrument, airline pilots choose GCA as their primary landing aid.

At Gander, Newfoundland, GCA is operated and used regularly by 10 trans-atlantic airlines—Air France, American Overseas, British Overseas, KLM, Pan American, Sabena, Seaboard & Western, Scandinavian Airways, Trans-Ocean and Trans-World; at Edmonton and Ft. Nelson, by Canadian Pacific planes, Northwest Airlines and Pan American.

Airline pilots also make daily use of GCA at Keflavik, Iceland; Shannon, Ireland; Prestwick, Scotland; London, Paris, Berlin; Fairbanks and Anchorage, Alaska; Shemya and Adak in the Aleutians; Tokyo, Chitose, and Okinawa, Japan; Seoul, Korea; Manila, Philippines; New York, Washington and Chicago.

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Russian Planes Show Improvement

Wartime fighters' performance stepped up while jet work continues. Transport program yields results.

Russia is pushing flight tests and development work on jet aircraft and turbojet powerplants, but its main reliance continues to be piston-engine fighters.

Development and production of transport planes has shown progress in the past year that is reflected in a growing number of production models in service.

These are the broad conclusions of a survey of Russian aircraft pieced together by AVIATION WEEK from reports reaching this country.

This information indicates:

▶ **Yak Improved**—The wartime Yak 9 fighter has been continually improved until the latest version, the model 9U, has a top speed of 450 mph., considerably better than the Republic F-47 Thunderbolt now on duty in Germany.

This speed gap is available only at low altitude, however, and the Yak 9U performance falls well below that of the Thunderbolt above 20,000 ft. The wartime Yak 9 fighter had a top speed of only 365 mph. and the increased performance of the new model is due to the new Klimov VK-107 engine.

This engine delivers 1800 hp. for takeoff, compared to only 1200 hp. in the earlier Yak 9 fighter. The new engine is designed to mount a 37-mm cannon firing through the propeller hub. In addition, the weight of the new fighter has been reduced from the 7000 lb. of the wartime version, providing increased maneuverability and higher ceiling.

▶ **La Series**—The Lavochkin fighter series has also been continued, with the La 9 the postwar version now in service. This is basically the wartime La 7 but with the new ASH-90 engine. This engine is a "Chinese copy" of the familiar Wright R-3350 Duplex Cyclone and provides 2000 hp. for takeoff and emergency military power.

The La 9 is also in the 450 mph. class due to this substantial increase in power over the 1600 hp. of the ASH-82 engine used in the La 7. The La 9 uses all-metal construction, in contrast to the moulded plywood shell construction of the wartime Lagg fighters, from which it is descended.

Armament includes two 20-mm cannon in the wings and two .50 cal. (12.7-mm) machine guns in the nose. The new fighter carries two auxiliary rocket motors under the wings for short burst of speed in the 500-mph. region.

Two ramjet engines have also been installed experimentally under the wing and may be used operationally whenever required.

▶ **Transports**—The well-known Ilyushin IL-12 continues in full production for Aeroflot with deliveries also scheduled for Czechoslovakia Airlines. Four different versions are available:

- **32-passenger** transport with a range of 800 miles.
- **27-passenger** transport with a range of 1250 miles.
- **16-passenger sleeper** plane with a range of 1850 miles.
- **Cargo version** with a capacity of about 8800 lb. over a very short range.

The IL-12, which closely resembles the SAAB Scandia, is now in use on trans-Siberian routes and makes the Moscow-Khabarovsk run of more than 4000 miles in 28 hours.

▶ **B-29 Transmuted**—The huge IL-18 is now undergoing service test preparatory to assignment on trans-Siberian routes. It carries 66 passengers and a crew of five. It has a span of 131 ft., is 101 ft. long and is, generally, a redesign of the TU-70, passenger version of the captured Boeing B-29 bomber.

The IL-18 is powered by four ASH-88 engines of 1700 hp. at 2400 rpm. for takeoff. It has a top speed of 310 mph. and a range of about 1850 miles.

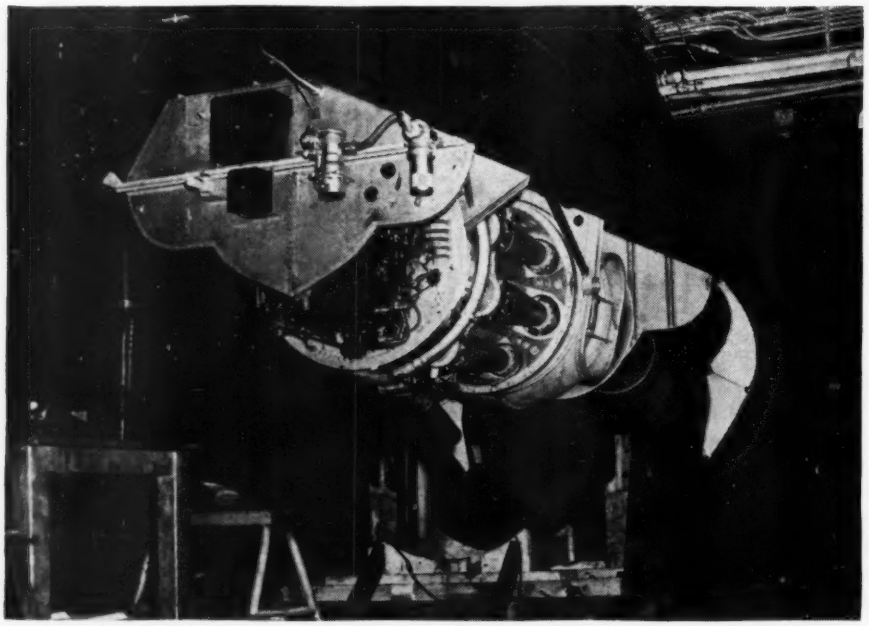
A newer Russian transport, not yet in wide service, is the Yak 16, a small but modern-looking feederline type with accommodations for 10 passengers and a crew of 3, a disproportion by U. S. standards. However, the third crew member is a navigator, which is required on even short-range Russian aircraft due to the lack of navigational aids and the barren nature of the country.

The Yak 16 is powered by two seven-cylinder SH-21 engines, which are actually a single bank from the double-banked SH-82 engine. For this reason, about 75 percent of the parts of the two engines are interchangeable, indicating an awakened Russian attitude towards the problems of maintenance and supply. The SH-21 produces 700 hp. and drives a two-blade propeller.

The Yak 16 has a top speed of 218 mph., cruises at 185 mph. and lands at 56 mph. It has a range of 625 miles and a 16,500 ft. ceiling. It is designed for short-range inter-city routes of Aeroflot and is being offered for "export" to Communist-controlled nations behind the Iron Curtain.

▶ **Research**—The design team of Mikoyan and Gurevich has continued its wartime series of single-seat fighters with a new postwar design that is believed to be a research type only. It is basically a wartime MIG-5 with an auxiliary rocket engine mounted in the tail.

It is powered by an ASH-82 piston engine developing 1825 hp. at 2500 rpm. for takeoff. The rocket engine uses



TEST BED ON A TEST BED

Britain's Phoebus turbojet engine, shown here mounted in bomb bay of Lincoln bomber, was purely a "slave" in the development of the Proteus turboprop, which is destined to power the Bristol Brabazon II and Saunders-Roe SR45 flying boat. An axial reverse-flow, straight jet unit with 2540 lb. s. t., Phoebus is a testing platform for turbine and compressor units eventually to be adapted to the Proteus. Although three or four have been made, the Phoebus engine will not go into general production.

liquid fuel and is believed to be merely a wartime German Walter motor adapted for the purpose.

In order to provide space and balance for the rocket fuel, the cockpit has been moved forward. The plane was flown in the 1946 aviation day display in Moscow but has not been reported since.

International Group Formulates Air Data

A step toward international agreement on standard thermodynamic properties of moist air in the range of pressures and temperatures of interest to aerodynamic, air conditioning and chemical engineers, and to meteorologists, was taken recently by members of the International Joint Committee on Psychrometric Data.

The committee is an autonomous group started in 1945 by the American Society of Heating and Ventilating Engineers.

The group voted unanimously to accept final report of its working subcommittee which recommended a formulation of the thermodynamic properties of moist air, which is claimed to be valid over a considerable range of pressures and temperatures, and thermodynamically consistent within the accuracy of existing data.

Essential ingredients of formulation are given in skeleton tables with recommended tolerances. Recommendations regarding best values of relevant physical constants and conversion factors are included.

On questions of terminology, the committee voted to define dry air as a fixed, mol-fraction composition. It urged that the term "specific humidity" be discarded in favor of "humidity mixing ratio" to designate weight of water vapor per unit weight of dry air.

Relative humidity was defined as "ratio of the given humidity mixing ratio to the humidity mixing ratio at saturation with respect to liquid at the given temperature and pressure." This definition was adopted previously by the International Meteorological Organization.

Objectives of the group are to:

- **Obtain information** regarding thermodynamic properties of moist air, which can claim general acceptance as standard on the ground that it is thermodynamically consistent within the accuracy of existing knowledge.
- **Develop specifications** of standard instruments for the practical realization of these properties in the field.
- **Recommend standard symbols,** terminology, and charts calculated to promote better understanding of underlying theory in its application to practical problems involving moist air.

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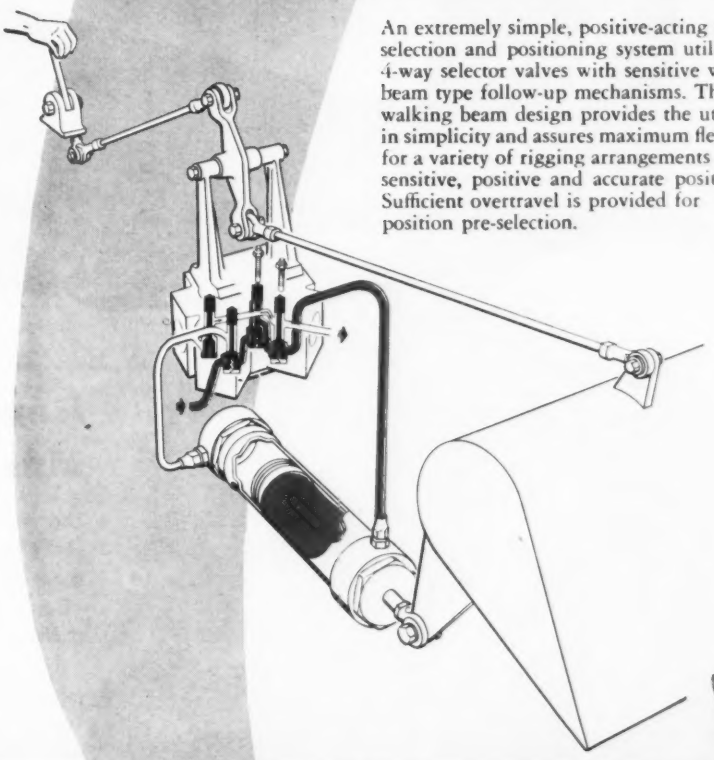

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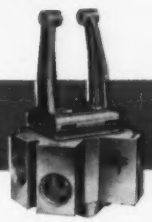

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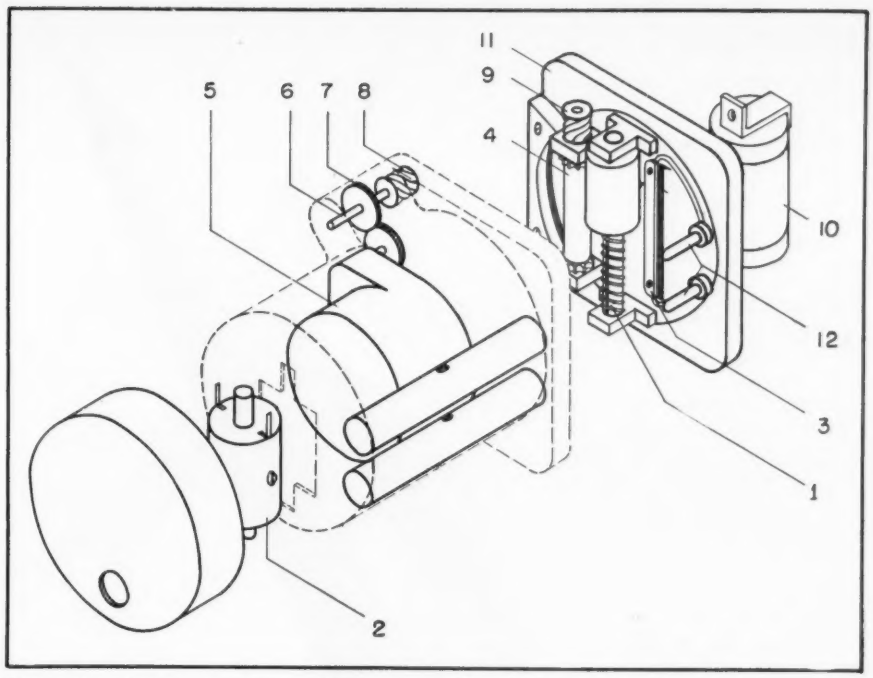

Schematic diagram of new panel-type accelerometer. The accelerometer unit (1) uses inertia of sliding bob restrained by spring. Coil (2) produces spark between electrode (3) and nickel tip on bob's side to pierce moving paper for permanent and instantly visible record. Power for roller shaft (4), which unwinds chart, is from synchronous motor, (5) to case front via shaft (6), spur gear (7), and spiral gear (8) contacting spiral gear (9). Sprocketed rollers on shaft (4) pull paper from cartridge (10) across cover inner face (11). Current to bob is through insulated banana plugs (12).

Devise Panel-Type Accelerometer

Small unit gives immediate indication and permanent record to meet requirements of flight training.

A panel-type accelerometer which will give instantaneous visual check and reference record of acceleration during combat maneuvers has been developed at the National Bureau of Standards by A. S. Iberall for the U. S. Air Force.

Immediate application of the new accelerometer is in training pilots for combat flying, where sharp turns must be made at high speeds. Practice in making such turns can be more effective if the craft's instrument panel is provided with an accelerometer that gives an instantaneous indication of acceleration while the maneuver is being executed. And, it is desirable to have a record of acceleration for quick reference after a flight has been completed.

▶ **How It Works**—A sliding bob, mounted on a shaft and restrained by a helical spring, serves as the acceleration-sensitive element of the device. Acceleration of the aircraft along the axis of the shaft displaces the bob by an amount proportional to the acceleration, at the same time compressing the spring.

The varying displacement of the bob from its rest position is permanently recorded on a paper chart by a repetitive high-voltage spark occurring at the position of the bob.

An instantaneous indication of acceleration is also obtained, since the record paper is visible through the transparent front of the accelerometer case.

▶ **Components**—The unit is fitted into a rate-of-climb indicator case of the standard aircraft-panel type. By means of the zero-setting shaft of the rate-of-climb indicator, power from a small synchronous timing motor for driving the record chart is transmitted from the back to the front of the case without obstructing the available space.

Sprocketed rollers mounted just behind the front of the case are thus made to pull the recording paper across the inner face of the cover and push it out the side of the case.

As the recording paper passes across the face of the instrument, it is punctured by sparks at a 60-cycle rate.

The writing electrodes consist of a nickel tip projecting perpendicularly from the bob, and the edge of a narrow strip mounted on the inside of the cover directly under the tip. Bob and nickel tip are made the high-voltage electrode while the plate and other parts are grounded to permit removal of the cover without electrical shock.

High voltage is provided by a small model-airplane spark coil mounted behind the motor. Current is brought to the bob through insulated banana plugs so that removal of the cover for loading will cut the voltage to the electrodes.

▶ **Recording**—Linear speed of the record chart is about 6 in./min. Cartridge for chart storage is mounted in a semi-cylindrical depression in the outside of the transparent plastic cover, which is slotted to receive the cartridge lips.

A 35mm., a single-weight, perforated, photographic paper with no emulsion was chosen for the record chart. Because thickness of the paper (0.005 in.) required more energy to form an easily visible trace than was available from the small spark coil, a simple preliminary chemical treatment was developed for the paper to intensify the trace.

▶ **Power Supply**—Necessity of operating the accelerometer from a 28v, d.c. source also required the development of a special power supply. A 60-cycle vibrator is employed in the usual way to produce 60-cycle a.c. for the motor.

However, the power dissipation of the small spark coil makes operation by a repetitive voltage "pip" most desirable. This pip is supplied by the inductive decay of the vibrator coil on the "break" of its main reed contact.

In laboratory performance tests at the Bureau, the device successfully withstood shock and vibration of at least 15G acceleration. Paper speed was found uniform to within a few percent. The record obtained was interpreted easily and adequate for resolving detail of amplitude not less than 2 percent of the total record width.

Temperature Control

An electronic device, claimed to be capable of measuring temperature change faster than the human brain can recognize the pain of a finger being burned, has been announced by Aireserach Mfg. Co., Los Angeles, Calif.

Called an electronic temperature regulator, the instrument was developed to control extreme temperature variations encountered in high-speed, high-altitude aircraft. It reportedly can be used for cabin temperature control, oil, fuel and engine temperature regulation, or anti-icing systems.

In a plane climbing from sea level to 40,000 ft. at 10,000 fpm., or driving at supersonic speed, ambient temperatures may vary as much as 166 deg. in less than 5 min. The new unit maintains temperature in the plane at a preselected value by anticipating outside variations in advance and reacting instantly.

It currently is being produced for the B-47, F-86, and F-89 aircraft.

Lockheed Penetration Fighter...

range, speed and durability

This is the F-90, a Jet Penetration Fighter, built for the U. S. Air Force by the Lockheed Aircraft Corp. It is designed to fly long ranges at high speeds. It can *penetrate* deep behind enemy lines to win and maintain air superiority and to destroy ground installations.

The F-90 is a big airplane for a big job. It is a rugged fighter, capable of inflicting heavy damage and taking a lot of punishment. And it is a two-fisted fighter—two jet engines, duplicate controls and two sets of everything else vital to an airplane's operation. It could suffer direct hits knocking out either engine or set of controls and still return to its base.

The F-90 is a versatile airplane, able to perform many jobs besides penetration fighting. It can be adapted as an ideal photo reconnaissance plane. Camera equipment can be serviced or replaced in a matter of minutes. Another simple modification and the F-90 is an excellent intercepter with outstanding climb, maneuverability and fire power. This quality of being many models in one spells additional Air Force economy and efficiency.

Lockheed

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ENGINEERING FORUM

More Mathematics For Delta Wing

I am sure all engineers appreciate your series of condensed technical articles, and the one on delta wings in your issue of July 4 should be no exception. In this particular article, however, there are several points in connection with the mathematics that seem to need further clarification.

Referring to page 22, second paragraph, under Lift and Drag, the data on the rectangular wing is purely theoretical, for a wing of thickness zero and aspect ratio 2. A practical wing of finite thickness in viscous flow is subject to compressibility burble, which greatly reduces the lift in the transonic range.

▶ **No Direct Comparison**—In the second paragraph under Lift Comparisons, the lift coefficients and their angles of attack are not given under parallel conditions that permit direct comparison. If the angle of attack is to be taken as that of a complete wing of symmetrical section, the first expression is good only for infinite aspect ratio, zero Mach number, and zero viscosity, and hence is obviously not valid for aspect ratio 2. The overall lift coefficient for a complete triangular wing of aspect ratio 2 is considerably less than given by the second expression in the same paragraph at zero Mach number, but tends to approach the given value as the Mach number approaches unity.

In the linearized expression for lift coefficient in the 4th paragraph, the angle of attack is the same for the section as for the complete wing, but only for two-dimensional supersonic flow which, in effect, applies when the leading edge lies outside the Mach cone. The same condition applies to the drag equations given in the third paragraph under drag analysis.

▶ **Hair-Splitting?**—In the second paragraph under Supersonic condition, at the risk of seeming to split hairs, I would raise the objection that drag due to lift in supersonic flow not only can be called induced drag, but is quite commonly so called (**E. G.** p. 8, Ref. 3). However, I thoroughly agree with your implication that "induced" is not a good term for this type of drag.

The two-dimensional drag due to lift, in linearized form, is quite simple as already noted. The equivalent expression for any Mach number and proportions of a delta wing is not particularly complicated, but is in three different forms, depending on whether the floor is subsonic, or supersonic; and in the latter case on whether the leading edge is within or outside the Mach cone. For a rounded "subsonic" leading edge (within the Mach cone), it is common practice to assume the theoretical leading-edge suction;* but as brought out by W. G. Vincenti in the recent international conference, the full value is not always attainable.

RALPH H. UPSON
Professor of Aeronautical Engineering
University of Minnesota

* Brown, Clinton E., Theoretical Lift and Drag of Thin Triangular Wings at Supersonic Speeds. N.A.C.A., T.R. No. 839, 1946.

(Thanks are due Prof. Upson for helpfully pointing out the omission of careful qualification so necessary in highly complex technical material. It was felt that reference to "hydrodynamic theory" implied the two-dimensional case. However, we stick by our guns in our criticism of the use of "induced drag" for the supersonic case. This implies an induced angle of attack created by propagation forward of pressure changes in the downwash field behind the trailing edge which, of course, is impossible in supersonic flow by definition. As mentioned in Col. 3, Para. 2, et seq., with a rounded leading edge the lift vector may actually be inclined forward, which not only prohibits the existence of an induced drag but actually creates an "induced thrust."—**R. McL.**)

What Do *You* Say?

As a service to its readers, AVIATION WEEK has inaugurated this Engineering Forum as a place where they can air their views—favorable, unfavorable, or supplementary—on engineering subjects reported in AVIATION WEEK or such engineering topics as they may choose.

The Editors hope this space can be an engineering tool of value to all aeronautical engineers. Like any other tool, its value will depend on how well and often it is used. Address your letters to

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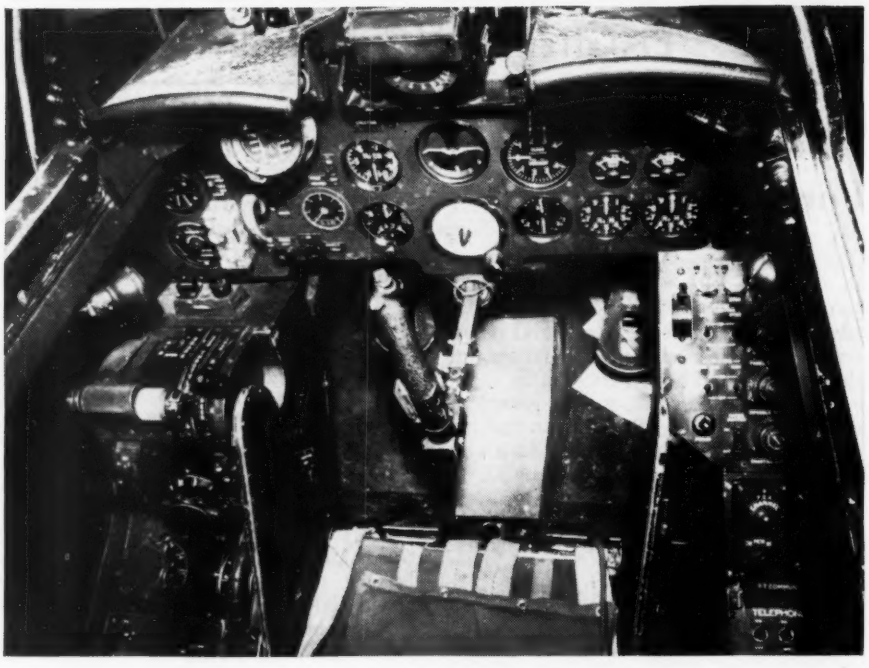
What Good Is It?

I enjoyed Robert McLarren's article on the tailpipe afterburner in the May 2 issue of AVIATION WEEK, but this is just another example of the tendency of engineers to get so wrapped up in the fine points of technology that they completely lose sight of the practicality of their end-product.

For example, using the figures in the charts, I estimate it would take about 3800 gal. of fuel for a fighter plane to climb to 40,000 ft. with afterburner operating all the way. So far as I know this is three or four times as much fuel as any of our present jet fighters can carry.

Therefore, even though this afterburner might double the rate-of-climb and the thrust available, what good is it if it uses fuel so rapidly that the fighter runs out of gas about one-third the way up?

H. C. M.
Sacramento, Calif.



Ideal Fighter Cockpit: British Style

(McGraw-Hill World News)

London—British version of an "ideal" cockpit layout for a fighter plane, developed by the Ministry of Supply, was exhibited here recently.

A mockup of the installation was fitted into a dummy fuselage about the size of the new Hawker jet-powered fighter, the P.1040, to provide a layout suitable for RAF or Navy operations.

Whereas controls are fitted for two piston engines, only very minor changes would be required to adapt them for other powerplant utilizations.

▶ **Control Grouping**—The arrangement shows what can be done by careful planning to reduce arm movements to a minimum. Controls are grouped in a natural pattern, leading to greater efficiency. By using distinctive shapes, identification by touch has been rendered almost foolproof—essential for night flying.

In the takeoff and landing group, the undercarriage buttons, flap lever, fuel cocks, trimming wheels and a shaped arrester hook control have been placed on or near the throttle and propeller pedestal.

▶ **Throttle Details**—After opening the throttles for takeoff, the thumb rests naturally against the landing gear buttons, which have warning lights alongside.

A spring-loaded arm fits over the throttles and prevents them from being pushed back during a rocket-assisted or catapulted takeoff. Thottles are thus kept open for maximum power.

An air-brake control switch mounted directly below the throttle lever affords finger tip manipulation.

▶ **Instrumentation**—Six blind flying instruments are set in a conventional pattern on the panel. Engine instruments on the starboard side have been simplified by omitting oil pressure and temperature gages and substituting warning lights. (This is in line with philosophy advanced by Lt. Cmdr. G. H. Hoover, USN, in his discussion of instrumentation for high-speed designs, appearing in AVIATION WEEK, May 23, 1949.)

The gyro-gunsight retracts into the coaming, leaving an unobstructed view when not in use. Gunsight is so positioned that, even when extended, clearance is adequate for operation of the ejection seat.

▶ **Electrical Controls**—These are grouped on a panel on the right of the cockpit and include armament switches, rheostat controls for cockpit lights, and main battery cut-out switch.

Fusing switches are lined up under the flexible rubber coaming where they can be seen by day with minimum eye movement.

▶ **Stick, Seat**—On the "push-pull" horizontal stick are a lever type brake control and gun firing and rocket buttons, all easily accessible to the finger tips, without confusion.

Also included is a new type of ejection seat which carries a built-in oxygen system.

Hood is closed electrically and jettisoned automatically before the cartridges fire to bring about ejection of the seat.

New Viewfinder Offers Many Uses

A new type viewfinder having possible applications for photo-navigators, aerial photographers and pilots, has been developed under the direction of the Photographic Laboratory at Air Materiel Command Headquarters, Wright Field.

Designated Type B-2, the device presents an erect, unreversed, clear image of the terrain directly below, or below and ahead, of the aircraft in which it is installed.

The image appears on an 8-in. diameter lens which can be placed on pilot's instrument panel if this location is desired.

The viewfinder consists primarily of two integrated optical systems. One gives a wide-angle image below and ahead of the plane, and is used for flight-line navigation and locating targets.

The second covers a narrower field, but in larger scale, directly below the craft. It is used to determine and correct drift and to act as a photographic viewfinder for cameras having small angles of field.

Both systems use the same clear-glass lens. Grids are provided for each type of image to aid in solving problems of drift, location of track line, correct exposure interval, and in determining the field of various cameras. Quick and easy changing from one optical system to the other is afforded.

The viewfinder is stated to have several advantages over those now in use. For one thing, AMC photo lab experts point out, installation of unit does not require extensive structural changes in aircraft. In the Beech RC-45, for example, all that is needed for satisfactory performance are two 2-in. holes. For jet aircraft, the optical path of the viewed image may be shifted and narrowed so that it can pass through a jet intake.

AMC reports that the Air Force is planning to try the device on a reconnaissance version of B-45 jet bomber.

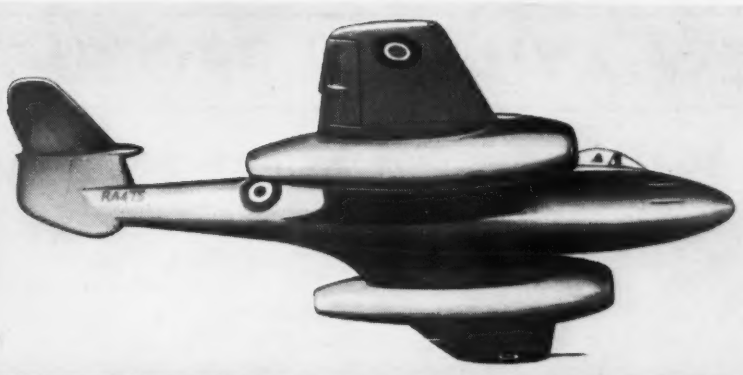
If unit proves feasible for Navy, it may solve three of its operational problems:

- Difficulty in accurately controlling aircraft when flying a photographic flight path.
- Poor visual observation in rescue helicopters when the objective is directly below the craft.
- Need for a method of more accurately aligning planes for landing on aircraft carriers.

While the new unit exhibits many potential uses, both Navy and Air Force technicians agree that the it must made more compact before it can be adopted by either service.

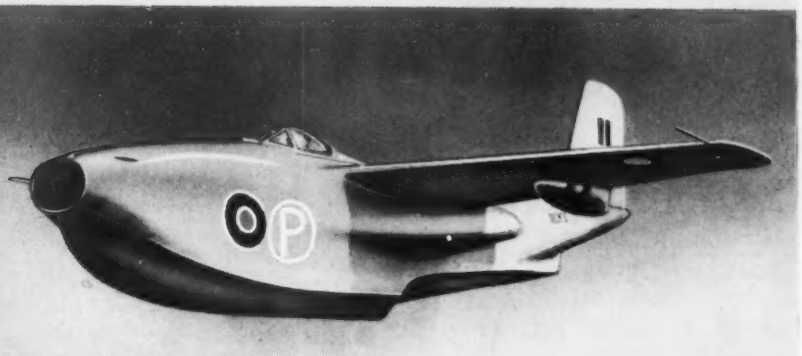
GLOSTER

METEOR IV



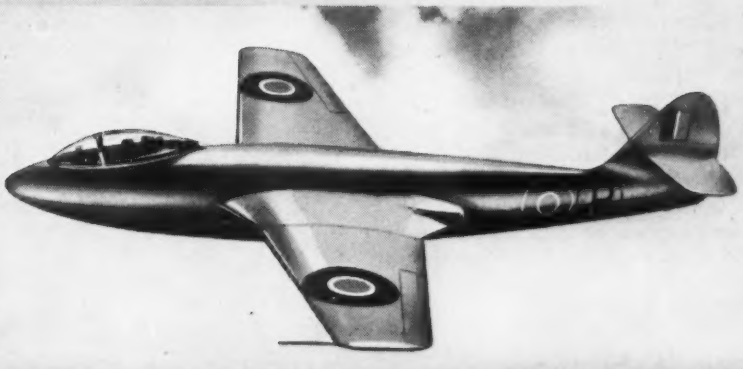
SAUNDERS-ROE

SR. A1



HAWKER

N7/46



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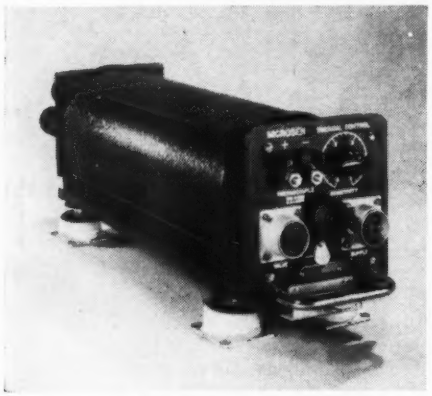
NEW AVIATION PRODUCTS



Control Amplifier

To meet stringent aircraft ambient conditions, "Microsen" control amplifier, Type 141, is offered by **Manning, Maxwell & Moore, Inc.**, Bridgeport, Conn.

Instrument incorporates highly sensitive, electro-mechanical d. c. amplifier as input circuit and power output stage to drive two-phase 400 cycle servomotor. Depending on requirements of particular control circuit, either derivative or integral stabilizing signals may be introduced. Shock mounted unit is entirely hermetically sealed and pressurized to minimize dependance on extremes of aircraft ambient conditions encountered.

Fast-Acting Clamps

"Eagle" hose clamp, offered by **Actus Corp.**, Mt. Vernon, N. Y., incorporates hinge action for quick installation and gear-type screw for fast take-up. To tighten, screw is first rotated to engage threads with clamp slots, and then turned with screwdriver. Clamp comes in five sizes for hose i. d. range of $\frac{3}{8}$-$3\frac{1}{4}$ in.

Maintenance Aid

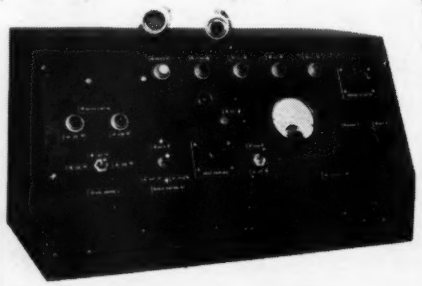
For line maintenance on aircraft or in factory, "Safeway Hydro-Lift," hydraulically raised, manually operated, rolling tower, offered by **Safeway Steel Products, Inc.**, 6228 W. State St., Milwaukee 13, Wis., provides workman's platform at any level from 7-17 ft. above floor.

Integral tubular steel ladder with hand rails gives access to platform when it is in retracted position.

Platform is raised on telescoping ram through operation of pump handle located on stand. It is lowered when hydraulic pressure is released by toggle on pump.

Guard rail may be lowered by pulling pins attached to chains at four corners. After rail is collapsed and platform lowered, tower can be moved through 7-ft. door.

Device rolls on four rubber-tired swivel casters. Safety brake on each caster locks both wheel and swivel.



Speeds Circuit Test

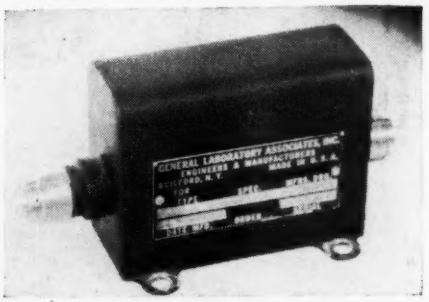
To permit one man to quickly and accurately check cabin heat and pressurization electrical circuits, special testing device has been developed by **Greer Hydraulics, Inc.**, 454 18th St., Brooklyn, N. Y.

Analyzer is represented to eliminate need for crawling into difficult places in aircraft and gives more thorough and speedier check of control system than can be obtained through use of ring-out method.

Test units are made to order to fit the needs of cabin heat and pressurization control circuit in a particular plane. Unit shown is for testing system in Convair 240.

Tells Screw Sizes

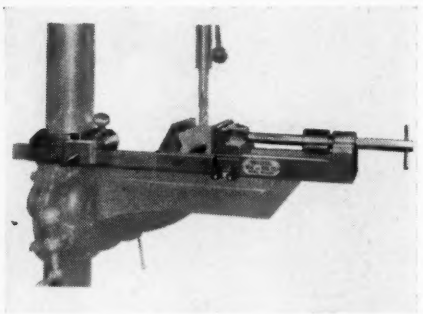
Screw and wire gage, offered by **Dayton Rogers Mfg. Co.**, Minneapolis, Minn., quickly tells wood or machine screw sizes from No. 0 to 14. Left hand side of V-slot will measure diameters from $\frac{1}{32}$ to $\frac{1}{4}$ in. Rustproof gage is about 3 in. long, $1\frac{3}{8}$ in. wide and $\frac{1}{16}$ in. thick. Device is offered free upon request made on company letterhead.



High Altitude Ignition

Hermetically sealed ignition units for small turbojet, rocket and ramjet engines, developed by **General Laboratory Associates, Inc.**, Norwich, N. Y., are designed for altitudes exceeding 60,000 ft. Smaller unit operates from 24v. d.c.; larger unit, 110v. a.c. 400c.

Devices weigh 9-11 oz., are impervious to moisture and able to withstand 50G accelerations. Designed to function evenly from −70 to 200 F., they are shielded to meet military requirements and are available with or without radio filters. High tension outlet can be supplied for 7 mm. plug connector or for high-altitude, spring-loaded terminal in 5 mm. or 7 mm. sizes.



Drill Press Vise

In addition to speeding drill press operations, new accessory "Col-Vise," frequently eliminates need for making simple jigs and fixtures. Developed by **Universal Vise & Tool Co.**, Parma, Mich., unit clamps to column of single or multiple spindle drill presses. Position of vise is adjustable both angularly and radially, and entire unit can be swung clear. Device has $1\frac{1}{2} \times 4$ in. jaws with a maximum opening of 6 in.

Models to fit drill presses having stationary or movable tables are available and $1\frac{7}{16}$ to $3\frac{23}{32}$-in. diameter columns can be accommodated. Accessory can be used as quick-acting machine vise by removing column connection and bolting ears to table.

PRODUCTION

Cocooning Avoids Line Shutdown

When F-86A landing gear supply was cut off, NAA kept production up by preserving incomplete planes.

North American Aviation, Inc. has developed a cocooning process for semi-completed aircraft to avoid costly production line shut-downs threatened because of delays in delivery of government furnished equipment.

First use of the cocoon process came when the strike at Bendix Aviation Corp. caused a shortage of landing gears for the North American Sabre (F-86A) jet fighter being built for the U. S. Air Force.

▶ **Cost $500**—North American used 15 sets of landing gears to put Sabres rolling off the production line through company flight tests. On completion of flight tests gear was removed. Sabres were sprayed with a plastic solution that dried into an airtight cocoon that would preserve the planes indefinitely. About 60 gals of spray were used per plane at a cost of about $500. When the Bendix shortage was most acute North American was cocooning three Sabres a day.

By cocooning the incomplete Sabres, North American was able to avoid a major production line shut-down and was able to catch up on its USAF delivery schedules much faster than if the entire assembly line had been stopped by the brake and wheel shortages resulting from the Bendix strike.

▶ **Employment Down**—The brief production delay resulting from substitution of a new type turbine bucket blade on the General Electric J-47 turbojet (AVIATION WEEK, July 18) did not require the cocoon process to keep production going.

North American total employment at its three plants has dropped from a January high of 21,231 to 17,869 with only the Downey plant where the AJ-1 production line for the Navy is well under way, showing an increase (3046 to 3420) during that period. Sabres now are being delivered to the USAF Fourth Fighter Group stationed at Langley Field, Va.

PAC Business Up On Both Coasts

Pacific Airmotive has corralled a new batch of engine overhaul and aircraft overhaul contracts that will swell considerably its backlog of business at both Burbank, Calif., and Linden, N. J., facilities.

The new deals are:

• **Overhaul for Pratt & Whitney** R-4360 Wasp Major engines for Boeing Stratocruisers to be operated by Pan American Airways and American Overseas Airlines. PAA job for Pacific-Alaska division will be done at Burbank and AOA handled at Linden.

• **U. S. Air Force contract** for reconditioning of T-7 trainers being reclaimed from storage depots. This contract will run through January, 1950 and totals about $750,000.

• **Contract With Flying Tiger Line, Inc.** to provide Pratt & Whitney R-2800 engines for the airline under a "leased power" agreement. Under this deal PAC supplies engine overhauls to Flying Tigers at a fixed price per flying hour. This is a trial agreement and will be continued only if it proves to be mutually satisfactory.

Supreme Court Upholds Lockheed

Lockheed's contract with the International Assn. of Machinists, Aeronautical Lodge 727, giving union shop stewards top seniority in layoffs, has been upheld by a unanimous decision of the U. S. Supreme Court. It reversed the lower courts.

The agreement was attacked by three veterans who were in the service in 1945 when a provision was added providing that union stewards were to be laid off last. In 1946, the veterans were laid off while a union steward with less seniority was kept on the job as provided by the contract. Although they were later rehired within a few weeks, the veterans sued for lost wages.

After the lower courts ruled in favor of the veterans, the union took the case to the Supreme Court in order to protect its contract.

The Supreme court referred to its original veterans' reemployment rights decision in the Fishgold case in reasserting that veterans are entitled only to the status they would have held if they had not gone into war service.

PRODUCTION BRIEFING

▶ **Avco Mfg. Corp.'s** Nashville division has a subcontract from Consolidated Vultee Aircraft Corp. to make flaps for the B-36 bomber being produced at Convair's Ft. Worth plant.

▶ **Carburetor Corp.** and Engine Air Service, Inc., Mineola, N. Y., have merged under the new management of Kenneth and Franklin Guiterman. New firm will retain the name Carburetor Corp. and is building 10,000-sq. ft. addition to plant.

▶ **Canadian Wooden Aircraft, Ltd.** stopped operations in its Straford, Ont., plant. Facilities have been sold to a furniture manufacturer.

▶ **Engel Aircraft Specialties,** Escondido, Calif., is modernizing plant facilities and doing research on new processes for fabricating metals.

▶ **Jack & Heintz Precision Industries,** Cleveland, now has $6 million in aviation equipment, with a reported addition of $1.5 million in contracts during June.

▶ **Pratt & Whitney** division of United Aircraft Corp. will be closed for two weeks (July 29-Aug. 15) for inventory.

▶ **Stanley Aviation Corp.,** Buffalo, was awarded $182,000 in USAF and Navy contracts to bring the firm's backlog to $319,562. They include: development of three-ton parachute cargo containers; new electronic fuel measuring instru-

ment; photographic print dryers for ground and airborne operations; and refinements for C-82 control systems.

▶ **Rochester Ropes,** Culpeper, Va., appointed Pacific Scientific Co. as West Coast representatives for its aircraft control cables.

▶ **TEMCO** (Texas Engineering & Mfg. Co.), Dallas, received additional subcontracts from Boeing and Consolidated-Vultee on the B-47 and B-36 bombers. Boeing contract is for 119 additional production tools for B-47 production. Convair order is for hard chrome plating of piston parts and rods for B-36.

▶ **Young Radiator Co.,** Racine, Wis., began manufacture of aircraft heat transfer units for the Air Force under a development contract.

▶ **Wright Aeronautical Corp.** reports $4.5 million in additional orders for Cyclone 18BD engines for Lockheed Constellations, with deliveries to begin in fall. Wright has delivered 60 of these engines for Constellation use.

▶ **East Coast Aeronautics, Inc.** has moved its facilities to 896 South Columbus Ave., Mount Vernon, N. Y.

▶ **Kaman Aircraft Corp.** has completed a demonstration tour with its helicopter of military bases. During tour 200 military helicopter pilots were checked out on the Kaman model and 1000 passengers were carried.

▶ **Convair** expects to deliver its first T-29 military trainer version of the Convair-Liner to the Air Force in September. The T-29 is being built at Convair's San Diego plant.

▶ **Republic Aviation Corp.,** Farmingdale, N. Y. will close down for two weeks, July 29-Aug. 15 for vacation.

▶ **Beech Aircraft Corp.** has completed an order for 20 twin-engine D18S trainers for the Chinese Air Force. The planes will be used by the Chinese on Formosa for navigation, gunnery, and bombardment training.

'Mike' for Electronics

Precision micrometer head, made by Frequency Standards Corp., P. O. Box 66, Eatontown, N. J., is designed for electronics applications and is available in English or metric scales, with both 1 in. and ½ in. thread travel.

Use of yellow scales against black anodized aluminum makes for easy reading. Anti-backlash screw thread, which also compensates for thread wear, provides positive spindle reading in either direction of rotation. Temperature compensation is accomplished with Invar spindle and nut, spindle threads being hard chrome and nut threads silver plated to provide good wearing surfaces.

Unit has non-corrosive finish and may be clamp- or flush panel-mounted. Size of all models is 2⅛ in. in diameter.

EIGHT HILLER 360's, including two cabin models, line up for delivery to dealers.

Hiller Ups Output and Outlets

United Helicopters, Palo Alto, Calif, is successfully establishing a worldwide distributor set-up, and plans to increase present production of 3 craft weekly to one daily by fall.

Distributors have signed up in France, Argentina, Canada and Venezuela, and in Florida, New York, Texas, Arizona, and California. Sixty-five Hiller 360's have been contracted for by these agencies and 23 have been delivered. Four more distributors in the States and six more abroad are in the final stages of being signed up.

Fabrication has been bought down to a minimum at the plant; major operation appearing to be assembly of parts shipped in by subcontractors. United is adding 5000 sq. ft. of warehouse space to facilitate operations.

Stanley Hiller, United's president, states that 70% of sales will see some form of agricultural usage. He reports that there are now over 4000 stockholders, and stock is now selling for the first time over the original $10-per-share asking price.

Useful load of the 360 has recently been raised from 800 to 815 lb. with CAA approval. Five models have been approved; open closed dusting spraying, and floats.

Latest Air Force Bid Awards

Air Materiel Command procurement Division makes available to AVIATION WEEK the latest bid awards, shown on this page. Requests for further information should be addressed to Contracting Officer, ACM, Wright-Patterson AFB, Dayton, Ohio, attention: MCPPSX72, (AMC will resume in the near future the issuance of data on invitation for bids.)

ABSTRACTS

For trailer & data (49-2348):
Kentucky Manufacturing Co., Louisville, on a bid of $406,981.19.

For clamp assembly (49-1892):
Companies sharing—Collord, Inc., Detroit, on a bid of $8317.20; Wittek Manufacturing Co., Chicago, on a bid of $4570.09; Aero Supply Mfg. Co., Inc., Corry, Pa., on a bid of $246.61; Air Associates, Inc., Teterboro, on a bid of $800.08; Clary Multiplier Corp., Los Angeles, on a bid of $205.81; Dzus Fastener Co., Inc., Babylon, N. Y., on a bid of $400.20; American Door & Machine Co., Los Angeles, on a bid of $11,112.49; Monadnock Mills, San Leandro, Calif., on a bid of $480.59, and Lamson & Sessions Co., Cleveland, on a bid of $354.24.

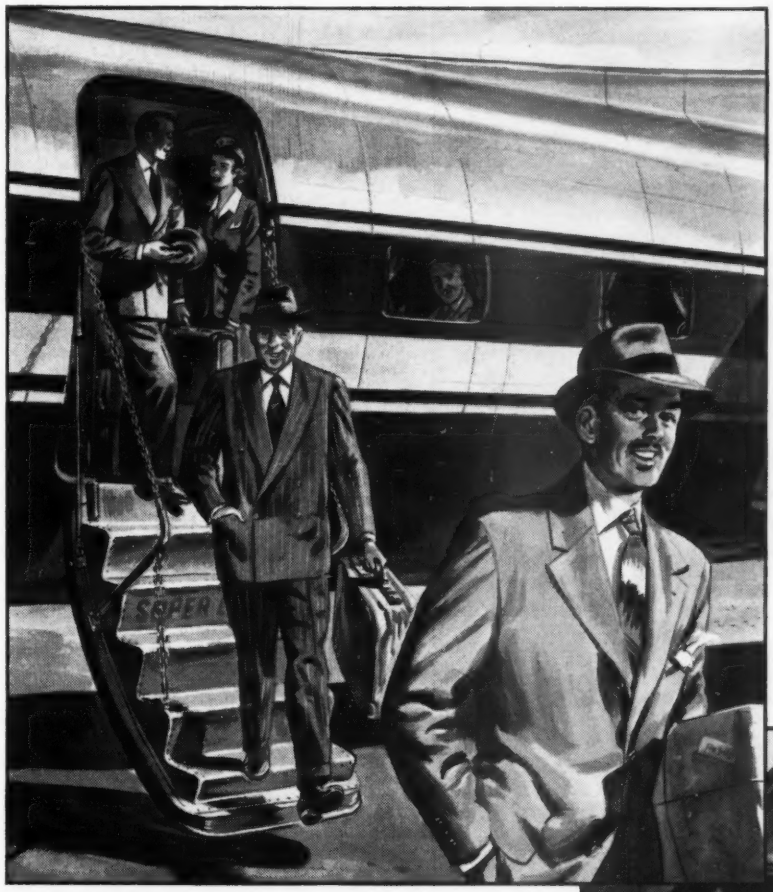
For volt-ohm-milliameters (49-2206):
Weston Electrical Instrument Corp., Newark, N. J., on a bid of $5415.

For adapter assemblies (49-1863):
Companies sharing—Arsco Manufacturing & Sales Corp., New York, on a bid of $550; Ohlson-Empire Div., Ohlson Intl. Corp., Long Island City, N. Y., on a bid of $7495.85; J. Pedersen Mfg. Co., Bridgeport, on a bid of $330; Aero Supply Mfg. Co., Inc., Corry, Pa., on a bid of $2952.15; Aircraft Hardware Mfg. Co., Inc., Bronx, on a bid of $2379; Lamson & Sessions Co., Cleveland, on a bid of $2273.05; MacWhyte Co., Kenosha, Wis., on a bid of $5460; Moore-Eastwood Co., Dayton, on a bid of $700; Breeze Corps., Inc., Newark, N. J., on a bid of $858; Weatherhead Co., Cleveland, on a bid of $2875; Aeroquip Corp., Jackson, Mich., on a bid of $18,625; Apex Machine & Tool Co., Dayton, on a bid of $2082.50; Sheldrick Mfg. Co., Upper Sandusky, O., on a bid of $143; Air Associates, Inc., Teterboro, on a bid of $11,509.50; Gaveco Laboratories, Inc., New York, on a bid of $4840; Operating & Maintenance Specialties, Charlotte, N. C., on a bid of $4024; American Chain & Cable Co., Inc., Detroit, on a bid of $9202.50; Clary Multiplier Corp., Los Angeles, on a bid of $240, and Kings Electronics Co., Inc., Brooklyn, on a bid of $675.

For photographic film (49-1886):
Companies sharing—Eastman Kodak Co., Rochester, on a bid of $233,042.31; Gevaert Co. of America, Inc., New York, on a bid of $4263.60; General Aniline & Film Corp., Ansco, Div., Binghamton, on a bid of $219,376.80, and E. I. du Pont de Nemours & Co., Inc., Wilmington, on a bid of $48,-468.42.

For voltmeters, oscillographs, & dials (49-1937):
Companies sharing—Allied Radio Corp., Chicago, on a bid of $2707.50, and Hewlett-Packard Co., Palo Alto, Calif., on a bid of $2853.75.

NEW SUPER DC-3 CUTS COSTS AND GROUND DELAYS!



Here's the fastest commercial transport to load and unload—both passengers and baggage—ever designed. It's the new Douglas *Super* DC-3!

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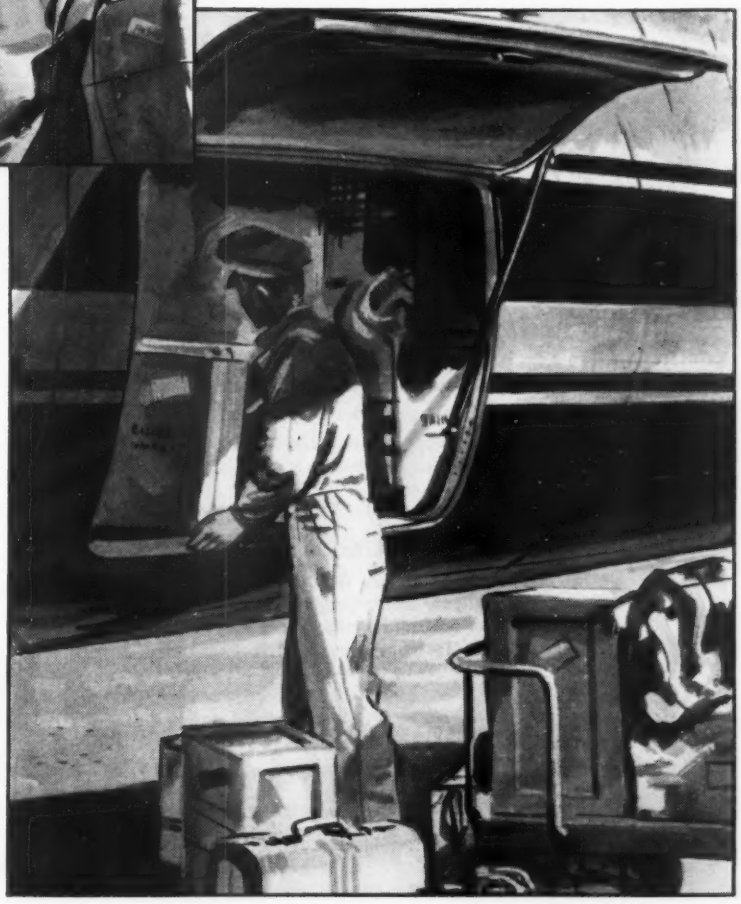

Large Cabin Luggage Racks speed ground time by enabling passengers to carry wraps and luggage directly on and off the *Super* DC-3. Built-in stair ramp ready seconds after arrival.

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For airport lighting control panel (49-1946): General Electric Co., Schenectady, on a bid of $5175.

For 48 electric exhaust fans (49-2027): International Engineering, Inc., Dayton, on a bid of $3638.98.

For aircraft replacement spares (49-2047): Companies sharing—Aircraft Products Co., Clifton Heights, Pa., on a bid of $561; Geo. W. Gayle & Son, Frankfort, Ky., on a bid of $182.70; John A. Roebling's Sons Co., Trenton, N. J., on a bid of $4246.70; American Chain & Cable Co., Inc., Detroit, on a bid of $29,552.79; Ohlson-Empire Div., Ohlson Int'l Corp., Long Island City, N. Y., on a bid of $1004.45; Aircraft Hardware Mfg. Co., Inc., Bronx, on a bid of $5263.33; Clay Multiplier Corp., Los Angeles, on a bid of $9458.79; Air Associates, Inc., Teterboro, on a bid of $2544.61; American Phenolic Corp., Chicago, on a bid of $1374.82; Homer D. Bronson Co., Beacon Falls, Conn., on a bid of $2190; Boots Aircraft Nut Corp., Stamford, Conn., on a bid of $2025.26; Elastic Stop Nut Corp. of America, Union, N. J., on a bid of $15,310.53; Nutt-Shel Co., Los Angeles, on a bid of $2003.40; Delron Co., Inc., Los Angeles, on a bid of $39,119.18; Standard Pressed Steel Co., Jenkintown, Pa.. on a bid of $9267.10; George K. Garrett Co., Inc., Philadelphia, on a bid of $2257.06, and H. K. Metal Craft Mfg. Co., New York, on a bid of $3666.68.

For cameras (49-2100): Mitchell Camera Corp., Glendale, on a bid of $47,620.30.

For transfer units (49-2349): Walter Kidde & Co., Inc., Belleville, N. J., on a bid of $9720.55.

For capacitors (49-2371): Companies sharing—Concord Radio Corp., Chicago, on a bid of $58; Wuter Co., Chicago, on a bid of $44.35; Aerovox Corp., New Bedford, Mass., on a bid of $1323.60; Tobe Deutschmann Corp., Norwood, Mass., on a bid of $275; General Electric Co., Schenectady, on a bid of $260; Sangamo Electric Co., Springfield, Ill., on a bid of $1130.

For covers, lamps, & finders (49-2381): Companies sharing—Semon Bache & Co., New York, on a bid of $337.50; Eastman Kodak Co., Rochester, on a bid of $8608.25; Otto K. Olesen Co., Hollywood, on a bid of $2463.50, and Arel, Inc., St. Louis, on a bid of $1246.

For 11,200 cases & screens (49-2391): Companies sharing—Compco Corp., Chicago, on a bid of $8000, and Da-Lite Screen Co., Inc., Chicago, on a bid of $20,640.

For bolts (49-2011): Companies sharing — Lamson & Sessions Co., Cleveland, on a bid of $6625.97; Rockford Screw Products Co., Rockford, Ill., on a bid of $5096.31; Clary Multiplier Corp., Los Angeles, on a bid of $917.26; Aircraft Hardware Mfg. Co., Inc. Bronx, on a bid of $8474.70; Aircraft Products Co., Clifton Heights, Pa. on a bid of $400; Aero Supply Mfg. Co., Inc., Corry, Pa., on a bid of $3367.12; Air Associates, Inc., Teterboro, on a bid of $2086.82; Standard Pressed Steel Co., Jenkintown, Pa., on a bid of $901.83; Cooper Precision Products, Los Angeles, on a bid of $522.09, and Continental Screw Co., New Bedford, Mass., on a bid of $580.62.

For gasoline hose (49-2067): United States Rubber Co., New York, on a bid of $39,370.40.

For bolts (49-2061): Companies sharing—Aero Supply Mfg. Co., Inc., Corry, Pa., on a bid of $7899.15; Sanford Aircraft, Inc., Inglewood, Calif., on a bid of $6616.10; Aero Bolt & Screw Co., Inc., New York, on a bid of $2701.90; E. W. Ferry Screw Products, Inc., Berea, O., on a bid of $2314; Aircraft Hardware Mfg. Co., Inc., Bronx, on a bid of $2468.50; Eaton Screw Products Co., Inc., Eaton, O., on a bid of $1124.25; National Lock Co., Rockford, Ill., on a bid of $2883.98; Ohlson-Empire Division, Ohlson Int'l Corp., Long Island City, N. Y., on a bid of $3175.68, and Air Associates, Inc., Teterboro, on a bid of $629.75.

For socket & adapter wrenches (49-2106): L. M. Engineering Co., Los Angeles, on a bid of $1661.56, and Recknagel Machine Products, Inc., Springfield, O., on a bid of $1322.65.

For volt-ohm-milliammeter (49-2268):
Shallcross Mfg. Co., Collingdale, Pa., on a bid of $9529.

For dummy loads (49-2249):
Electric Impulse Laboratory, Eatontown, N. J., on a bid of $7150.

For 2535 chairs (49-2200):
Companies sharing—Roth Office Equipment Co., Dayton, on a bid of $30,635; Charles G. Stott & Co., Inc., Washington, D. C., on a bid of $6900, and McConnaughey Stationers Inc., Springfield, O., on a bid of $29,730.

For hydraulic test cylinders (49-2155):
Abbot Machine Co., Milwaukee, on a bid of $27,104.35.

For conveyor assemblies (49-2149):
Logan Co., Louisville, on a bid of $27,422.

For grommets & hinges (49-2126):
Companies sharing—H. K. Metal Craft Mfg. Co., New York, on a bid of $458.97; American Door & Mach. Co., Los Angeles, on a bid of $3528.30; Camloc Fastener Corp., New York, on a bid of $1835.50; Lion Fastener Inc., Honeoye Falls, N. Y., on a bid of $1117.50; Homer D. Bronson Co., Beacon Falls, Conn., on a bid of $2600; Air Associates, Inc., Teterboro, on a bid of $5398.85; Pargh Machine Co., Inc., New York, on a bid of $8240; Aeroquip Corp., Jackson, Mich., on a bid of $750; Shakeproof, Inc., Chicago, on a bid of $447.50; Aircraft & Aircraft Supplies, Los Angeles, on a bid of $875; Clary Multiplier Corp., Los Angeles, on a bid of $403; Western Washer & Stamping Co., Los Angeles, on a bid of $302.25; George K. Garrett Co., Inc., Philadelphia, on a bid of $2028.64, and Whitehead Stamping Co., Detroit, on a bid of $1224.

Invitations to Bid

Bid openings are 20-30 days after approximate issue dates shown in the following bid proposals. Bid sets containing specifications for items to be procured will be sent to qualified applicants who state bid invitation number.

One bid set will be available for examination without obligation by prospective bidders, after bid publication date, at each of the seven AMC procurement field offices. This will enable firms to see specifications before writing or telegraphing for their own bid sets.

Procurement field office locations: Boston Army Base, Boston 10, Mass.; Government Aircraft Plant No. 4, Ft. Worth 1, Tex.; 39 S. LaSalle St., Chicago 3; Wright-Patterson AFB, Dayton, Ohio; West Warren and Longo Aves., Detroit 32; 155 W. Washington Blvd., Los Angeles; 67 Broad St., N. Y. 4.

Current bid proposals:

Radio Equipment, 1-6 items, bid invitation No. 50-2, issue date Apr. 13, delivery as soon as possible.

Metal Chairs, 1-2 items, bid invitation No. 50-3, issue date Apr. 12, delivery 60 days.

Electric Indicator & spare parts, 1-2 items, bid invitation No. 50-5, issue date July 18, delivery 14 months.

Thermocouple, 1 each, bid invitation No. 50-6, issue date July 18, delivery 30 per month.

Communication Equipment, 1-9 items, bid invitation No. 50-7, issue date July 28, delivery by Sept., 1950.

Adapter, 162 each, bid invitation No. 50-8, issue date July 25, delivery 30 per month starting Mar., 1950.

Photographic Equipment, 1-5 items, bid invitation No. 50-11, issue date July 25, delivery earliest possible.

Mount Assembly, 172 each, bid invitation No. 50-12, issue date July 25, delivery earliest possible.

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GOOD CUSTOMER RELATIONS keep HSC working at top speed.

Big Field for Copter Spray

Helicopter Services of California handles record business by exploiting numerous opportunities.

Aided by specially devised agricultural attachments, Helicopter Services of California has completed dispersal of one million pounds of liquid chemicals to kill weeds in grain fields.

Record was compiled during the spring of 1948 and first few months of 1949, but does not include dusting, seeding, fertilizing and surveying jobs performed by HSC.

▶ **Special Attachments**—Custom-built 500 gal. capacity tank trailers, drawn by jeeps, solve the problem of transporting water for spraying operations. The California concern has also devised a complete spraying accessory system and specialized units for seeding and dusting.

HSC has made great strides in customer relations. By basing and loading the copter on the grower's premises, he can observe and direct all phases of the spraying operation. Grower's confidence is also assured, by being in close contact with the pilot, since he can easily warn of obstacles and give instructions as to special treatment for certain field areas.

▶ **Find Other Tasks**—In addition, the two-year-old concern each year flies thousands of miles of line patrol for the Pacific Gas and Electric Co. and the Pacific Telephone and Telegraph Co. HSC pilots are able to penetrate areas roughed up by storms to find and report breaks and trouble spots days ahead of competing ground crews.

Flying for the U. S. and State Forest Services, the concern has undertaken reconnaissance and transport flights during forest fires. HSC successfully completed the first aerial seeding by helicopter when 1000 acres of burn in the Angeles National Forest was seeded to prevent soil erosion and floods from menacing nearby towns.

▶ **Service Booklet**—Company's services are outlined in a 12-page booklet distributed to growers throughout the California area. The booklet gives a point-by-point discussion of why the helicopter is best suited to spray 2,4-D, best proven herbicide for broad-leaf weed eradication. Also described are other helicopter functions, including row crop dusting, spraying and drying; orchard spraying, dusting and drying; mosquito and fly control; and seeding and defoliation. Two pages of testimonials from California users of agricultural helicopters are also included in the booklet. It is titled, "Weed Control by Helicopter for Easier Farming—Higher Yields."

Helicopter Services of California has executive offices in San Francisco, and operates from Oakland Municipal Airport. The company maintains an advisory service which is available for consultation without charge to customers.

Water Tank Perils Roosevelt Field

Roosevelt Field, Mineola, L. I., has filed suit to prevent local commissioners from erecting a 162-ft. water tower 3000 ft. from the northern boundary of the field, in the turning and gliding zone of two runways.

Roosevelt Field claims the tank constitutes an aeronautical hazard and violates regulations for the protection of air navigation established by CAA.

Currently, Roosevelt Field holds a Class 2 airport rating. If construction of the tank is adjudged legal, the field will lose its rating since it would not qualify under a CAA regulation requiring no obstructions within a glide path of 30 ft. horizontally to every foot vertically from the end of the usable area of the field's landing area.

The case is scheduled for Oct. 5 in U. S. District Court, eastern district.

Calif. Private Plane Legislative Moves

California lawmakers successfully beat down attempts at the 1949 legislative session to abolish the state aeronautics commission by cutting it off at the pockets.

▶ **Budget Cut**—Moves were made in the state assembly to eliminate the commission's budget request for the 1949-50 fiscal year, but backers were able to keep a $109,000 appropriation for it in the state budget. The figure represented about two-thirds the amount which was originally requested by the commission.

Commission spokesmen said the cut will hamper its activities to a "considerable extent" but it still will be able to carry out its principal function of furthering the development of airports and aviation generally in the state.

Other legislative developments were:

- One of the bills, four of which were put through the legislature by assemblyman Ralph Brown, D., Modesto, would relieve aircraft owners and pilots from liability for injuries or deaths suffered by non-paying guests unless "intoxication or wilfull misconduct" can be proved.
- Another of the series makes it a felony to tamper with aircraft.
- A third makes it a prison offense to steal an airplane.
- The fourth in the Brown series limits mechanics liens on aircraft to a total of $250.
- Governor Warren also signed a bill by Sen. Arthur Breed, R., Oakland, authorizing the State Aeronautics Commission to regulate operation and landing of heliocopters and similar aircraft in populated areas.

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HELIOPLANE STATUS—Manufacturing rights to the slow-flying Helioplane are expected to be made available to other manufacturers in addition to Fairchild Engine & Airplane Corp. The company which developed the plane, Helio Corp. of Boston, wants to make its present two-place prototype available for production to an established light-plane manufacturer as soon as it finishes with current tests. The license to Fairchild was non-exclusive as applies to personal aircraft. Design features incorporated in the Helioplane by its developer Prof. Otto Koppen would be adaptable to most of the current high-wing planes of its size with more or less modification, although indications point toward the Piper Vagabond as a likely first candidate for applying the Helioplane features. (The prototype Helioplane was designed around a Vagabond fuselage.)

STANDARD PRODUCTS INC.—The new firm of Standard Products, Inc., at 650 East Gilbert, Wichita, has taken over the fixed assets, shop equipment and inventory of the former aviation division of S. A. Long, Inc., at the same address. E. L. Crabb, president of the new organization, formerly was vice-president in charge of the aviation division. Other principal officers of Standard Products are J. F. Garufo, vice president, and G. C. Wilson, office manager and assistant treasurer. The new organization will continue distribution of AN hardware, tools, supplies, instruments, accessories, test equipment, Hollingshead chemicals, titanine dopes, airwing fabrics, reading batteries, and the operation of a CAA-approved laboratory for instrument and accessory service.

CROSSWIND GEAR SAFETY—John Geisse, CAA consultant on the castering crosswind landing gear points out that 5.9 percent of 1948's major aircraft accidents were due to ground loops, 11.1 percent due to under-shooting or over-shooting the runway, and 12.5 percent were due to nosing up or over. Use of the cross wind gear eliminates ground loops completely, and because of this effect, the main wheels can be placed farther forward, as a preventive for nose-overs, Geisse states. And if single-runway airports, made possible by cross-wind gear usage, become more prevalent, these runways could be extended to minimize the under-shooting and over-shooting hazard. He recommends laying two runways end to end, as the best method of airport design for safety, and points out adaptability for heavy transport and military use in emergency.

ATLAS DEMONSTRATORS—Production of 10 demonstrator models of the Atlas H-10 all-metal four-place plane are scheduled to start soon at Hemet, Calif., according to announcement from H. Ross Peacock, Atlas Aircraft Corp. president. The 220 hp. plane was first announced a year ago (AVIATION WEEK, Aug. 23, 1948) by Max B. Harlow, then Atlas president, and designer of the H-10. Peacock said the corporation had received approval by the California commissioner of corporations on application to issue and sell 200,000 shares of $5 par stock. Public offering will be 38,000 shares, the remainder being subscribed or earmarked for dealers and company personnel, he said. Plane is expected to sell at "around $3000." The H-11's original target price of $2995 met with considerable industry **skepticism last year.**

CLIPPER ON FLOATS—Pushing its best seller, the four-place Piper Clipper, into new fields of competition, Piper Aircraft has obtained CAA approval on a float-type version of the Clipper which will sell at $4907.18. A demonstrator float-equipped Clipper is now touring New England and Middle Western lake areas. The model 1650 Edo floats cut into the Clipper's payload, and slow its cruising speed, as floats always do, but they are penalties the seaplane owner is willing to pay when he is flying in lake country. With floats the Clipper payload shows up at 688 lb. cruising speed at 97 mph. and landing speed at 52 mph. It has a 400-mi. range with full 30 gal. fuel load. As a carrier of four people, there isn't much room for luggage or fuel in the seaplane, but for a couple on a vacation trip, there is plenty of room left for gear and fuel, and that obviously is what Bill Piper Sr. was thinking about.

—ALEXANDER McSURELY

AIR TRANSPORT

Airlines Study Fuller Use of GCA

Near accidents during ILS approaches point up value of monitoring function of radar system.

The domestic airlines are redoubling their efforts to have pilots take full advantage of the additional margin of safety that GCA (ground controlled approach) monitoring can provide in ILS landings.

Vast majority of domestic airline pilots are not familiar wth GCA facilities, according to one top Civil Aeronautics Administration official who had many discussions with flight crew members during an extensive tour of scheduled U.S. routes.

He said it appeared that most pilots do not even realize that GCA now is available at Chicago, New York and Washington (and should soon be ready at other points).

▶ **Mishaps Cited**—Two near-accidents last March emphasized the value of radar-monitored ILS approaches. It was felt that one of the incidents might have been avoided had the pilot making the approach received both advisory and emergency information issued by the GCA controller.

On Mar. 26, an American Airlines DC-6 struck a power line during an instrument landing system approach to Chicago Municipal Airport. An emergency pull-up was made; and the flight continued to Indianapolis, where it made a normal landing. There was no damage to the aircraft or injury to passengers.

▶ **Descent Too Rapid**—Civil Aeronautics Board investigation showed that the flight left the outer marker at the proper time but at an altitude 500-600 ft. higher than required. In order to lose this excess altitude before passing the middle marker, a rapid descent (about 1300 ft. per minute at 150 mph. airspeed) was continued without regard to glide path indication.

The pilot said he started slowing his descent when his altimeter registered 350 ft. above the airport level, but the plane went slightly below 300 ft. before the descent was actually checked.

Nearly two miles short of the airport, and before reaching the middle marker, the DC-6 struck the second of two parallel wires about 145 ft. above the field elevation. The wires are 381 ft. below the ILS glide path.

▶ **Warnings Unheard**—GCA at the Chicago airport was monitoring the ILS approach and initiated calls to the American DC-6 several times, stating that the plane was below the glide path. The pilot said that due to poor reception he heard none of these warnings and was not even aware his approach was being radar monitored. The co-pilot stated he heard the final warning but not in time for any action to be taken before the plane struck the power line.

Immediately after the incident, the ILS glide path and localizer were checked and found to be operating normally. The DC-6's altimeters were well within tolerances. ILS equipment in the plane was functioning normally except for one defective tube in the glide path receiver which caused intermittent operation of the receiver but not erroneous readings.

Officially, the mishap was blamed on the flight crew's failure to maintain sufficient altitude to clear obstructions during an instrument approach.

▶ **New Orleans Case**—Just two weeks before this incident, a Chicago & Southern Air Lines DC-4 making an ILS approach to Moisant Airport, New Orleans, struck trees but continued on to a normal landing although the craft was considerably damaged. There is no GCA installation at New Orleans to monitor ILS approaches.

CAB said tests showed conclusively that the ILS receiver in the DC-4 was out of calibration and that the cross-pointer indicator did not give sufficient warning to the pilot that the plane was below the glide path. When other C&S pilots subsequently reported difficulty with the glide path while making simulated ILS approaches, tests were made on three of the company's planes (a DC-3 and two DC-4s).

It was found that the ILS receivers in all three planes were improperly calibrated.

▶ **ATA Makes Study**—With these mishaps emphasizing the value of radar-monitoring ILS approaches, the Air Transport Assn. is trying to determine the best method of providing pilots with GCA advisory or emergency information. It is considering three procedures:

- GCA advisory and emergency information to be transmitted over the ILS localizer voice frequency, with the pilot monitoring this frequency inbound from the outer marker. CAA would provide the tower controller with an "override" feature on the GCA frequency so that warning could be given of blocked runways.
- GCA advisory information to be transmitted over the ILS voice channel; GCA emergency information going over the approach control frequency, with the pilot monitoring the approach control frequency, and CAA providing an "override" feature for GCA on the approach control frequency.
- Both GCA advisory and emergency information to be transmitted over the approach control frequency, with both pilots monitoring the approach control frequency.

▶ **First Method Favored**—ATA believes the first of these three methods is the most acceptable for several reasons. Transition from a cautionary or advisory type of GCA information to an emergency transmission is immediate in nature and requires almost instantaneous reaction by the pilot. Further, immediate reception of and reaction to GCA advisory or cautionary information might make unnecessary the issuance of an emergency transmission.

Second method was not considered desirable by ATA because advisory and emergency information would not be associated. The pilot monitoring the approach control frequency would not receive the advisory information, and his first warning would be the emergency transmission unless the advisory information was relayed by the other pilot.

Third method also is considered undesirable because if advisory information is transmitted over the approach control frequency, the approach control functions must stop during the time the aircraft is inbound from the outer marker.

Puerto Rico Adopts New Nonsked Rules

Concerned over recent crashes involving nonscheduled airlines, the Puerto Rican government has incorporated Part 42 of the U.S. Civil Air Regulations (governing irregular operations) into its territorial laws, and provided more severe penalties for violations of the safety rules than the Civil Aeronautics Administration can impose.

Violators of the Puerto Rican statute are subject to a $10,000 fine or two years in prison, or both. Puerto Rico is also requiring irregular operators to file with the territorial Transportation Authority two copies of all insurance policies carried on passengers. The Transportation Authority is empowered to notify passengers of the results of aircraft and crew inspections and to advise whether insurance is provided.

Underwing Fueling Future Big

Carrier studies underway on modifying all transports to use system.

Underwing fueling has proved such a complete success on Northwest Airlines' Martin 2-0-2s that the carrier has recommended incorporation of this loading arrangement on all new commercial aircraft as standard equipment.

"For the most part, major defects in the entire underwing fueling system have been eliminated," NWA asserts. "The method has brought about a completely new concept of thinking toward the aircraft fueling operation."

▶ **Other Adaptations**—Appearing at a recent airline meeting on ground equipment held at Miami, NWA representatives urged that the same principle of bottom loading be adapted to the many other ground fluid service operations which now require climbing up ladders, over wings and into the cabin for top loading. They said that not only underwing fueling but also the associated high-filling rates of 200 and over have proved extremely advantageous even on twin-engine, short-haul operations.

Northwest, which has had over 20 months experience with 2-0-2 underwing fueling, indicated it is making a detailed study of applying the method to its DC-4s. Representatives of other carriers said they were interested in using underwing fueling for their DC-6s and Convair-Liners.

▶ **Convair Fittings**—Western Air Lines already has installed the necessary underwing fueling fittings on its Convairs. NWA said that upon completion of its study of DC-4 installations it will supply the information to other carriers.

Underwing fueling has developed rapidly ever since the Air Transport Assn. approved the standardization specifications of the 2½-in. bayonet connector early in 1946, NWA declared.

Bottom loading, as well as another fast fueling process, single-point fueling, is being widely adopted throughout the aircraft and other industries.

The Navy is equipping aircraft carriers with Wayne "Collaps-a-Hose" systems and is using single-point fueling on its fighter and transport planes. Goodyear is planning single-point loading on blimps.

▶ **Wright Field Tests**—The Air Force is testing 400-gpm. single-point fueling through a 4-in. connector at Wright Field and is proposing underwing or single-point fueling for many of its heavy bombers. Railroads are now using side loading at 200 gpm. on their diesels both for water and fuel; and an oil company is testing the use of bottom loading for fuel transport trucks.

Foreign countries also have recognized the merits of underwing fueling. The J. C. Carter Co. has shipped underwing nozzles to over a dozen other nations.

NWA RECOMMENDS underwing fueling.

Northwest lists these advantages of underwing fueling:

• **Decreased Ground Service Time**—Not only is the preparation time reduced but also the pumping time due to the higher flow rates made possible by bottom loading. Underwing fueling at 200 gpm. has cut total fueling time in half on Northwest's Martin 2-0-2 operations.

This allows the carrier to perform other service operations when fueling is completed, thereby reducing total ground time. Also, when defueling is required, the underwing fitting provides a convenient and fast method.

• **Safety**—The obvious danger of climbing up ladders and on top of wings, especially in bad weather, is eliminated by underwing fueling. For this same reason, all other fluid service operations should be considered for adaptation to bottom loading. Service crews who have become accustomed to underwing fueling complain about having to fuel overwing on other transports.

• **Decrease in Vapor Loss**—Fuel agitation and associated vapor loss is reduced by bottom loading. One oil company estimates actual savings are between .1 and .25 of 1 percent of the fuel handled.

• **Reduction in Service Personnel**—By reducing the time required for each of the ground service operations, including fueling, the end result is either a minimum ground time or a minimum number of service personnel.

Northwest has underwing fueling facilities at all of its domestic stations except Washington National Airport. Some are 200-gpm. 2½-in. "Collaps-a-Hose" systems, and some are 50-gpm. 1½-in. solid-hose systems.

In an overall program to decrease ground service time, NWA provided 200 gpm. underwing fueling at all normal fuel stops and installed underwing nozzles on existing 50 gpm. systems at alternate and low fuel take-on stops.

Black Ink

Domestic airline profits for the first six months are nearly $4 million.

A flood of new revenue and traffic reports is spreading a new look of prosperity throughout the domestic airline industry.

Complete official figures show that the 16 scheduled domestic trunklines earned a fat $3,936,000 operating profit during May, with all but one company finishing the month in the black.

As a result, the industry was nearly $3,600,000 to the good at the end of the first five months of 1949. Prospects were good that June earnings would boost first-half domestic operating profits over the $7 million mark (AVIATION WEEK, July 11).

▶ **Profits Listed**—American Airlines showed the largest domestic operating profit in May—$1,328,000. United earned $770,000; TWA $700,000; Northwest $268,000; Eastern $229,000; Capital $210,000; Chicago & Southern $125,000; Braniff $113,000; Mid-Continent $93,000; Western $67,000; Colonial $56,000; Delta $33,000; Inland $32,000; Continental $11,000 and Northeast $7,000. Only National was in the red—by $112,000.

Last year in May, the 16 domestic trunklines earned only $870,000 and were about $14 million in the red for the first five months of 1948 because of huge first quarter losses. Delta, National, Northeast, Northwest and Western all lost money in May of last year.

▶ **UAL Comeback**—United Air Lines, one of the first carriers to issue a first-half report, made a spectacular revenue and traffic comeback in the second quarter. After losing more than $3 million (the industry's biggest deficit) in the first three months of the year, UAL earned $3,435,000 operating profit and $3,147,000 net profit on its domestic and Hawaiian routes during April, May and June.

Result was a $365,000 operating profit and small $175,000 net loss for the first half of 1949. Revenue passenger miles were up 16.9 percent, mail ton miles 30 percent and freight ton miles

21.6 percent compared to the first six months of 1948.

▶**Future Unclear**—Curtis Barkes, UAL vice president-finance, said it is difficult to predict whether the present high traffic level will continue against the general downward trend in business in general.

Some industry officials are apprehensive over the effects on the scheduled domestic airlines' passenger volume of recent nonscheduled airline accidents and the KLM crash in India.

Other recent airline reports:

▶**American**—Flew 156,009,000 passenger miles during June, a gain of 14.6 percent over June, 1948, and the most ever reported by an airline in a single month. Passenger load factor was 73.4 percent.

▶**Delta**—Flew more revenue passenger miles in first half 1949 than in any similar six-months period. Gain was 20.3 percent over the first six months of 1948. Passenger load factor rose from 51.8 percent in first half 1948 to 59.1 percent in first half 1949.

▶**National**—Is experiencing the biggest off-season (summer) business in its history, largely as a result of low summer excursion fares between northern points and the Florida resorts. NAL's winter earnings are usually chipped away during the summer, but this year the carrier reported it was breaking even in mid-July.

"We could have done it before, but this is the first year we've been able to convince the Civil Aeronautics Board that lower fares mean more business," G. T. Baker, National's president, asserted.

▶**Northwest**—Record systemwide revenues of $4,079,000 and a record net profit of $1,022,000 were reported during June.

The June earnings, following profits of $360,000 in April and $525,000 in May, wiped out NWA's first quarter deficit of $1,482,000 and left the carrier with a systemwide net profit of $430,915 for the first six months of 1949. In first half 1948, Northwest had a $2,016,000 net loss.

▶**Pioneer**—Earned $56,614 net profit in first half 1949, compared to $15,808 in the same period last year. Revenue passengers carried jumped from 39,619 to 48,600. In May the feederline retired all its bank loans, leaving it completely free of debts other than normal trade obligations.

Traffic Up

Scheduled international airlines have entered the busiest season in their 30-year history. The International Air Transport Assn. reports that 1949 summer traffic started off at a point only slightly below that reached at the peak of last year's summer business.

Standard Quits

Coast-to-coast nonsked loses petition for stay in Court of Appeals.

After more than a year of legal battling with the Civil Aeronautics Board, Standard Airlines, one of the largest and best-known transcontinental nonskeds, suspended operations at the end of last month.

Since May, 1948, the Long Beach, Calif., company has been fighting a CAB order requiring it to show cause why its nonscheduled letter of registration should not be revoked for conducting scheduled operations in violation of the Civil Aeronautics Act. The Board had ordered suspension of Standard's operating authority last August pending outcome of the revocation case, but this action was set aside by the U. S. Court of Appeals.

▶**Court Rejects Plea**—On June 20 of this year, CAB ordered SAL's letter of registration revoked for "knowing and wilful" violations of the law and told the carrier to stop engaging in any form of air transportation after July 20. Again Standard took its case to the courts, asking a stay of the Board's or-

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der, but late last month the U. S. Circuit Court of Appeals for the District of Columbia denied the petition filed by the company.

Standard told the court that it would suffer "irreparable" damage if forced to cease operations in accordance with CAB's order. CAB denied that Standard would be hurt seriously, asserting that the carrier already had made arrangements for leasing its equipment to other nonscheduled lines.

► **Leasing Agreements**—On file with CAB are equipment leasing agreements Standard has negotiated with Trans National Airlines, Long Beach, Calif., and Associated Airways, Inc., Burbank, Calif.

SAL says it has no stock interest in Trans National or Associated.

It is expected, however, that CAB will continue to keep a close eye on Standard. The Board in the past has had considerable experience with nonskeds which ostensibly go out of business but actually turn up operating under another name with the same personnel and equipment.

► **Profits Reported**—Organized as Fireball Air Express early in 1946, Standard operated almost daily transcontinental flights during much of 1948 and early 1949, according to CAB records. SAL's coast-to-coast fare was $99, compared with $157.85 on the certificated airlines, and the company has shown substantial operating profits.

The line at first used DC-3s exclusively but later operated C-46 and DC-4 equipment. Standard made an estimated 2000 transcontinental flights during its three years of operation. With only 87 employes, it handled over 5000 passengers during one three-month period last year.

Standard's president is Stanley Weiss, an Air Transport Command pilot in World War II. Vice President James Fischgrund was chairman of the National Independent Air Carriers and led that association's unsuccessful fight against CAB's series of crackdowns on nonscheduled operators.

► **Crash Inquiry** — A week before it stopped operations, Standard had its first fatal accident. A SAL C-46 crashed near Chatsworth, Calif., killing 35 of the 48 occupants. CAB hearing on the mishap was to be held in Santa Monica, Calif., last week.

With Standard grounded, CAB will press its enforcement action against several other nonscheduled operators on the transcontinental and New York-Puerto Rico routes which are also charged with conducting illegal scheduled service. These companies include Airline Transport Carriers, Burbank, Calif., Viking Air Lines, Burbank, and American Air Transport, Miami Springs, Fla.

Stratocruisers Go On Domestic Runs

Northwest Airlines plans to inaugurate the first scheduled domestic service with Boeing Stratocruisers this week with flights between the Twin Cities and Chicago.

Transcontinental Stratocruiser flights between New York and Seattle will be established by Sept. 1, according to R. O. Bullwinkel, NWA vice president-traffic. Detroit, Milwaukee, the Twin Cities and Spokane will also be served on the coast-to-coast schedules.

Standard fares will be charged for NWA's regular Stratocruiser accommodations. Berths from New York to Seattle will be $90 (plus tax) extra.

Committee Studies Fuel Concessions

Arguments between the airlines and airport operators over the granting of exclusive concessions at airports for fueling services, recently authorized by Civil Aeronautics Administration, are being scrutinized by the Senate's Interstate and Foreign Commerce Committee.

Last week, the committee had before it:

• **An analysis by Eastern Air Lines** showing that exclusive fuel concessions at airports would add $66 million to the scheduled airlines' annual operating costs—or about 16 percent of their total revenue for last year. The deduction was based on the assumption that if airlines are required to purchase their fuels on an airport-to-airport basis, they will no longer enjoy the cut-rates they now obtain from suppliers through contracts covering their whole systems.

• **A counter estimate** by CAA Administrator D. W. Rentzel that the exclusive fuel concession plan at airports will save the airlines "more than $10 million" annually. Rentzel based his claim on the assumption that airport concessioners will obtain cut-rates by bulk purchases to supply all airport users. Rentzel is now preparing a detailed rebuttal of the EAL analysis for study by the Senate committee.

CAA issued an order on May 10 permitting airport operators to grant exclusive fuel concessions. Airport operators and airlines have been wrangling over the issue for over four years.

New Mail Rate Proposed for TWA

TWA, which has edged into the black during 1949, should soon be able to wipe out some large deficits from past years.

The carrier has been offered about $5 million additional temporary mail pay for services over its trans-Atlantic route between Feb. 5, 1946, (when it first opened the link) and Dec. 31, 1947.

► **Operated at Loss**—Under the show cause order, TWA would receive $9,738,000 (80.6 cents a plane mile) for the 23-month period instead of $4,711,000 (39 cents a plane mile.) TWA lost $4,669,000 on its international operations between Feb. 5, 1946, and the end of 1948 under its former temporary mail rates.

Since deficits on TWA's domestic service during 1946-48 were also substantial, the stockholders' equity in the company's combined operations was reduced to $8,469,000 from $18,498,000. In view of this situation, CAB has offered the carrier the $5 million increase to strengthen its position pending completion of a final mail rate case.

► **Policy Clarified**—The Board in its TWA decision made clear that it no longer requires an airline to prove that its immediate financial position is critical before it can obtain higher tem-

MID-WEST GETS FIRST 190

First airline to use single-engine equipment for regular scheduled passenger and mail service takes initial delivery of Cessna 190 five-place planes to be used. Shown with plane are: F. C. Anderson, Mid-West president; Harlan Miller, writer; George Yates, Des Moines Register-Tribune; and James J. Ramsey, Nebraska's director of aeronautics.

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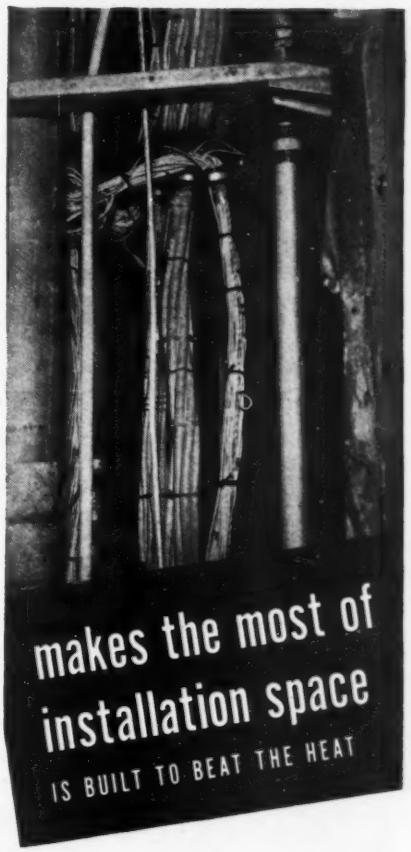

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porary mail pay to replace an existing rate.

"We no longer feel we should wait for a financial crisis," CAB said. "Rather we think the temporary rate device may appropriately be employed not only to alleviate an existing financial crisis but also to forestall the creation of such a crisis."

The new temporary mail rate of 80.6 cents a plane mile proposed for TWA is considerably higher than the final rates offered its competitiors—Pan American Airways and American Overseas Airlines—for 1946 and 1947. AOA would receive 55.1 cents a plane mile and PAA 72.4 cents a plane mile.

Braniff Brings Claim Against Mexico

T. E. Braniff, president of Braniff Airways, has asked the U. S. State Dept. to present a claim for at least $1,250,000 to the Mexican government for loss of financial investments in the cancellation of flying permits of Aerovias Braniff, S. A.

Braniff's recourse to top-level diplomatic channels comes following a ruling against the Dallas-based airline early last month by the Mexican supreme court. Braniff has sought to obtain redress through Mexico's courts since cessation of the air service in October, 1946.

► **Reopens PAA Duel**—The claim rehearses previously-aired charges that Braniff was fought in various ways by Compania Mexicana De Aviacion, S. A., subsidiary of Pan-American Airways. Originally, Braniff's Mexican link was planned as part of its Latin-American service which has now been extended to Rio De Janeiro and Lima via Havana and Panama.

"The Braniff case" assumes current importance in view of Mexican government and private efforts to obtain financing in this country for industrial development in Mexico.

Nonskeds Outstrip Regulars at Oakland

During June, for the second consecutive month, uncertificated aircoach operators handled more passenger traffic at Oakland, Calif., Municipal Airport than the scheduled airlines.

Port of Oakland statistics show that the independents flew 11,789 passengers in June, compared with 11,023 for the scheduled airlines. In May, uncertificated operators carried 11,150 passengers against 10,849 for the scheduled airlines — United, TWA, Western, American and Southwest.

The independents' June traffic increased 6.5 percent over May, while the scheduled airlines' passenger business at Oakland was up about 2 percent.

► **Six-Months Gains**—Scheduled airlines handled 58,033 passengers at Oakland during the first six months of 1949, compared with 51,443 in the first half of 1948—an increase of 12.8 percent. Uncertificated lines in first-half 1949 handled 39,492 passengers at Oakland—a 208 percent gain over the 12,876 who were carried in the first six months of 1948.

Port of Oakland and the Oakland chamber of commerce have been at odds with the certificated airlines for some time, charging that too many scheduled flights overfly Oakland, forcing residents of that city to board planes at San Francisco Municipal Airport.

Australia-India Tie

(*McGraw-Hill World News*)

MELBOURNE—Recent conclusion of an air transport agreement between Australia and India may indicate a policy change on the operation of foreign air services in Australian territory.

Indian government airline is authorized stops at Darwin and Sydney. Similar to the pact with Pakistan, the agreement has a "capacity" clause designed to prevent uneconomic competition between the airlines of the two countries.

Australia's Department of Civil Aviation is still hedging on an agreement with Air Ceylon. Applications by Air France and KLM are also still hanging fire.

Pan American Airways, the only American carrier permitted to land in Australia, has requested permission to make Melbourne the terminal point, but Australian government has refused to grant it.

Australia's policy has been to give landing rights only to foreign government airlines, and to exclude all foreign airlines from revenue-earning operations in the Commonwealth.

Empire Certificate Extended 15 Months

Empire Air Lines, Boise, Ida., has been given a 15-month extension of its temporary feeder certificate.

The franchise had been due to expire Sept. 27, 1949, three years from the date Empire started service. But the Civil Aeronautics Board decided the carrier had shown sufficient progress to warrant extension of the franchise to Dec. 31, 1950.

► **Traffic Generation**—A comparison of Empire with six other certificated feederlines shows it has made excellent penetration of the traffic over its 709-mile system, and its operating costs have been in line with other short-haul carriers, CAB declared. In 1948, Em-

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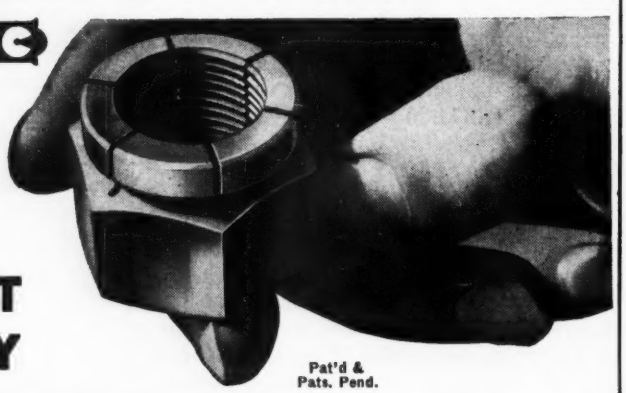

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pire generated 76.6 passengers per 1000 population served, against 54.8 for West Coast Airlines, 54.2 for Pioneer, 35.9 for Monarch, 29.9 for Challenger, 20.3 for Southwest and 11.2 for Trans-Texas.

The 15-month extension will provide CAB with more data to weigh Empire's progress since it switched from Boeing 247Ds to DC-3s in March, 1948.

TWA Hits 20

A 90-mph. Ford Tri-Motor lumbered through a 12-day touch-and-go flight from Los Angeles to New York late last month, marking the 20th anniversary of coast-to-coast service by Trans World Airline.

The craft, rented by TWA for the occasion, was flown by owner Clint Johnson and Jack Keinath. The Ford made 19 stops on its way to New York, each one at a TWA-served city. It flew the last leg of the flight—from Philadelphia to New York—in 1 hr. 20 min.

On hand at LaGuardia Field to meet the "Tin Goose" were Warren Lee Pierson, board chairman, and 20-year employees of TWA. It was reportedly the first time a Ford Tri-Motor had ever landed at the nine-year-old field.

SHORTLINES

▶ **Air France**—Had 100 percent payload factors on its eastbound trans-Atlantic flights during July, with only scattered seats available through August and September. . . . Company has resumed its Constellation flights to Israel via Paris.

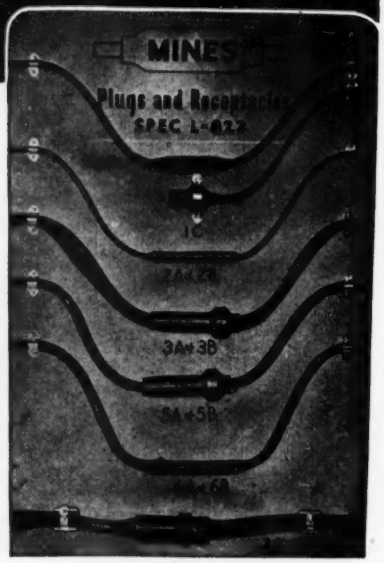
▶ **Air Line Pilots Assn.**—ALPA executive board at a recent meeting in Chicago unanimously endorsed pending legislation in the House and Senate which would recreate the independent Air Safety Board. President David L. Behncke cited the "many ocean flight turnbacks of Boeing Stratocruisers" as the most recent of many reasons for passage of the legislation at the earliest possible time.

▶ **American**—Has declared the regular quarterly dividend of 87½ cents a share on the corporation's $3.50 cumulative convertible preferred stock, payable Sept. 1.

▶ **Avianca**—The Colombian carrier's 1948 annual report showed the company flew 432,498 passengers last year, an increase of 46 percent over 1947, and had a net profit of $740,405. The line operates scheduled service to over 60 points in Colombia and flies to Panama, Ecuador and the U. S. An affiliate, Aerotaxi Limited, uses a fleet of Cessna 195s for service to small fields in remote regions.

Electrical Connectors for Aviation Field Lighting

THAT MEET CAA SPEC L-823



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1C	2E125F1A FEMALE RECEPTACLE—Same electrical specifications as above.
2A & 2B	1A187M MALE PLUG and 1A187F FEMALE RECEPTACLE (joined)—Single conductor—25 ampere . . . 1500 volts to ground.
3A & 3B	52242 MALE PLUG and 52241 FEMALE RECEPTACLE (joined)—Five conductor, two 15 and three 6 ampere—600 volts between contacts . . . 1500 volts to ground.
5A & 5B	2D125M MALE PLUG and 2D125F1 FEMALE RECEPTACLE (joined)—Two conductor—20 ampere—600 volts between contacts . . . 1500 volts to ground.
6A & 6B	1X187M MALE PLUG and 1X187F FEMALE RECEPTACLE (joined)—Single conductor—25 ampere . . . 5000 volts.
4A & 4B	6-187KM2A MALE PLUG and 6-187KF1A FEMALE RECEPTACLE (joined)—Six conductor—25 ampere—600 volts between contacts . . . 1500 volts to ground.

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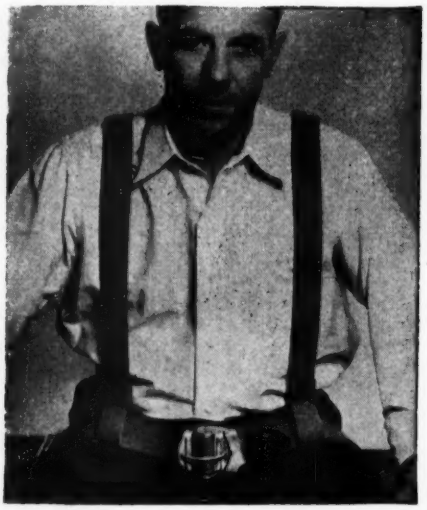

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► **California Legislature**—Has again defeated attempts to bring intrastate airline operations under control of the State Public Utilities Commission. State assembly also rejected a resolution asking the Civil Aeronautics Board to require all airlines to meet the same safety standards.

► **Coastal Air Lines**—The uncertificated operator has received a special CAB exemption to make a roundtrip DC-4 flight between Newark and Paris carrying students and members of the American Field Service, a nonprofit organization of wartime ambulance drivers.

► **Eastern**—Reports it schedules more plane miles weekly than any other domestic airline.

► **Northwest**—Cargo loads on NWA flights to Hawaii have soared during the longshoremen's strike in the islands.

► **Pan American**—Has asked CAB permission to serve Nice, France, as a co-terminal with Marseille.

► **Pioneer**—CAB may cut the feeder's mail rate because PAL's revenues have been higher and its expenses lower than expected when the Board established a pay formula last December.

► **Swissair**—Has inaugurated service from Zurich to Belgrade, Yugoslavia. The flights constitute the only direct link between Yugoslavia and western Europe.

► **TWA**—Time involved in major overhaul of the company's DC-3s at the Kansas City base has been cut from 5500 man-hours seven months ago to 2800 man-hours as the result of an improved work sequence plan which permits savings of $120,000 annually.

► **United**—Has had a 100 percent completion factor for its DC-6s since the start of San Francisco-Honolulu service about two years ago.

CAB SCHEDULE

Aug. 1—Hearing on renewal of Southwest Airways' feeder certificate and suspension of United Air Lines' service at six West Coast points. (Dockets 3718 and 3867)

Aug 1—Prehearing conference in air freight rate investigation. (Docket 1705)

Aug. 4—Hearing on British West Indian Airways' application for Trinidad-Miami foreign air carrier permit. (Docket 3742)

Aug. 8—Hearing on Carco Air Service's lightplane route application. (Docket 3629)

Aug. 15—Hearing on Hughes Tool Co. control of TWA. (Docket 2796)

Aug. 22—Hearing on extension of Expreso Aereo InterAmericano's Havana-Miami foreign air carrier permit. (Docket 3717)

Sept. 6—Hearing on service to Lake Tahoe. (Docket 3623)

Sept. 12—Hearing on CAB investigation of International Air Transport Assn. agency resolutions. (Docket 3350)

Sept. 26—Hearing on Seaboard & Western and Transocean Air Lines applications for all-cargo certificates between the U. S., Europe and the Middle East. (Dockets 3041 and 3818)

Nov. 14—Hearing in Western-Inland mail rate case. (Docket 2870)

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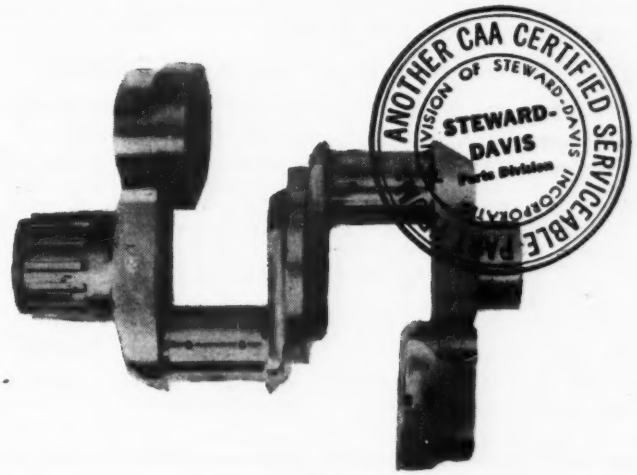

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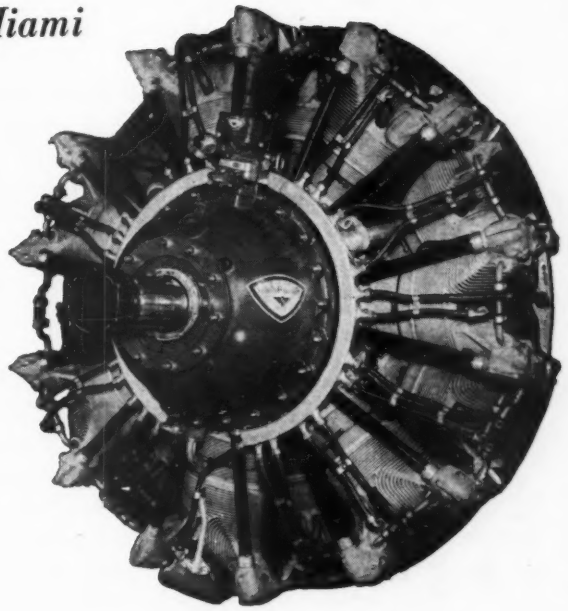

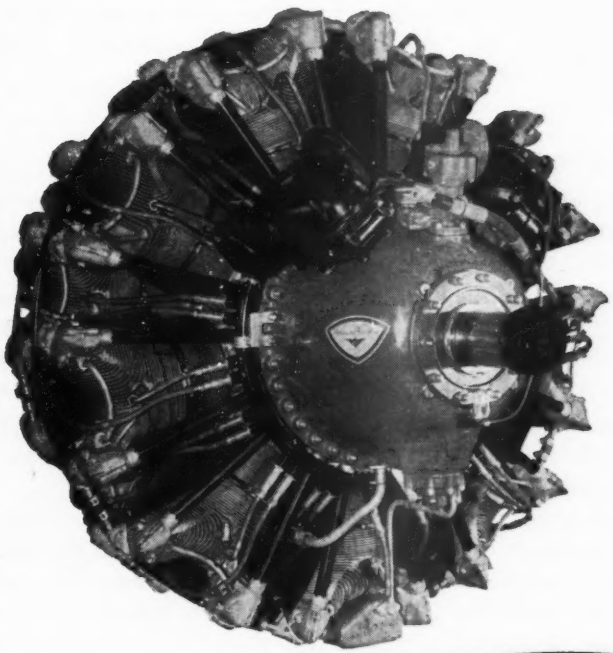

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TILLIE SMALL & MASTER LULL—**Tillie Small** in United Air Lines' passenger service office in San Francisco decodes signatures from manifests and sends souvenir passenger lists to all UAL customers who have flown between San Francisco and Honolulu. The other day she dispatched one to "Master Gene Lull." Back came a happy letter from a 60-year old major general, pepped up by the rejuvenation, says **Bob Costello,** our spy.

* * *

FOLLOW THAT CAR—**Bill Wagner** of Ryan Aeronautical Co., tells one on **William P. (Doc) Sloan,** assistant to Ryan V.P. **Earl Prudden.** Doc has delivered Navions all over the world, and was based during the war in India and China. But he had been in Washington only once when he hailed a cab in front of the Statler recently, jumped in with gusto, and sang out his destination to the driver as "Carlton Hotel." The baffled cabby finally blurted out, "Whassamatterya? Cantcha walkcrossastreet?" jerking a thumb toward the other side of K St.

* * *

EASILY DETACHABLE SIXES—**A. A. Boon Hartsinck,** who is a victim of the closing of the Los Angeles office of Alvin P. Adams & Associates, offers a tid-bit quote from a new publication of United Air Lines entitled "Mainliner Flight Plan." It contends: "After every 725 hours of flying time United's Mainliners are routed to the base and disassembled, cleaned, then thoroughly checked with modern electronic equipment. After re-assembly they are test-flown, approved and returned to service in like-new condition." Boon says "Here we probably have the explanation why United loses money, if they take their airplanes apart every 725 hours. It has brought a good laugh from people I have shown it to, but so far I don't think UAL has done anything about changing this part."

* * *

PANTS FOR PUDDICOMBE—We published here June 6 an appeal of one **Adetuji Puddicombe** of Lagos, Nigeria, for pen pals in the U. S., who would send gifts. It seems that Puddicombe collects gifts as a hobby, practical fellow that he is. As you may recall, Puddicombe's letter indicated only a speaking acquaintance with English, and one of the items he appealed for was (were) "snap-shorts."

So imagine the startled surprise of our very efficient secretary, **Miss Adelle Mignot,** on opening an innocent-looking manila envelope from **William R. Spencer** of Continental Air Lines' publicity department. Out fell a pair of men's underpants. It seems that Spencer, upon reading this column for June 6, dived into his drawers and came up with some shorts for Puddicombe. They have not only "snaps" but buckles. Proclaims Pen Pal Spencer:

"These shorts have reclined in the lower drawer of my desk for some two years now. Believe they must have fallen out of the brief case of some traveling traffic man or interline salesman who has been ashamed to claim them. These are not the best shorts in the world but I believe them to be substantial and perhaps your Mr. Puddicombe may be able to put them to some use. Sorry we cannot provide something more colorful—with hand-painted ants or wolves such as our own **Stew Faulkner** wears, but these are economical times and we must make the most with what we have at hand." Thank YOU, Mr. Spencer. Now, we have a gentleman in the balcony, Mr. **Ed Bauman,** aviation columnist and broadcaster, who comes through with a scotch-tape envelope marked personal and confidential (and a good thing, too) containing one of those novelty knitted unmentionables, obviously designed for a small boy. It looks a little unnecessary for African climate and besides, we're afraid to put it into the mails for Puddicombe. But these gifts hearten us; shows the "pulling power" of AVIATION WEEK, and maybe we could sell some of those two-line ad messages to intersperse in the colyum like the country weeklies do.

—R. H. W.

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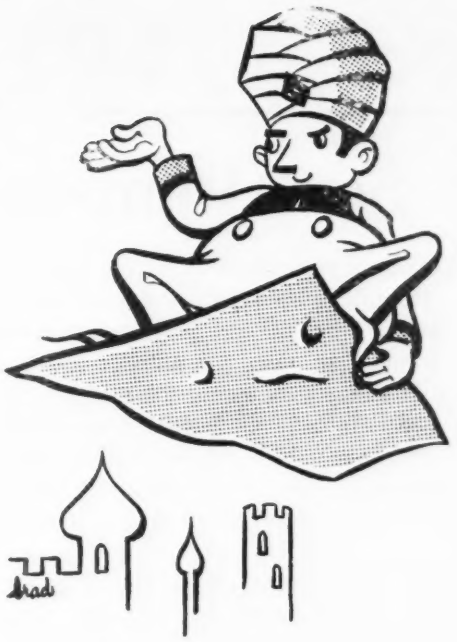

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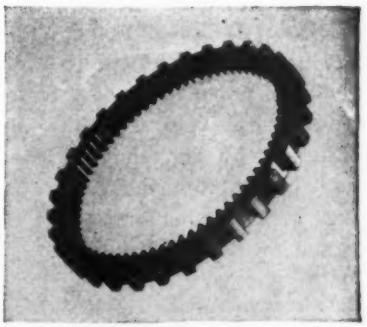

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EDITORIAL

Sen. Johnson's Sound Appraisal

Broad outline of the program Congress may propose to strengthen the airlines has been revealed by Sen. Edwin C. Johnson, whose Interstate and Foreign Commerce Committee is investigating industry finances.

Speaking at Kansas City during TWA's 20th anniversary celebration, Johnson came out flatly for separation of service mail payments from subsidy. He urged more consolidation of ground services, additional equipment interchange agreements and thorough exploration of the potentialities of air coach.

The address was temperate, unprejudiced, and discriminating in its analysis of air transport problems. The senator apparently has been able to discern basic problems despite the inevitable muddying of the record by a minority of intemperate and inconsequential material presented on both the scheduled and non-scheduled sides.

Sen. Johnson believes air transportation "is about to become the most attractive and economic transportation in history. . . . I still look for a tremendous increase in air traffic volume."

The speaker said: "It is clear that Congress as well as the Civil Aeronautics Board may have to consider means to induce airlines to transfer routes and to merge or consolidate on reasonable terms and in the best interests of the public."

He advised airline management to consider carefully all merger possibilities.

"Great credit is due the airlines for the speed with which they reversed their field and ran for cover" during the hard times of postwar. "Nevertheless, they have not gone as far, nor as fast, as the economic pressures demand."

Turning to airline financing, Johnson asserted some carriers had adopted unwise policies. He criticized operators who have not maintained a reasonable ratio between debt and equity financing.

He said he was reluctant to advocate further encroachment by government on the domain of business management's normal function. "But the unpleasant facts disclosed by our inquiry cause me to favor the imposition of CAB control over security issues," he said.

The chairman emphasized that his statements did not necessarily reflect the thinking or judgment of the Interstate and Foreign Commerce Committee. It is expected, however, that the committee majority's views will not vary substantially from Johnson's.

Although the airlines are not yet out of the woods, 1949 has been a turning point in the industry's fortunes, Johnson declared. "Fixed charges and operating expenses have declined slightly . . . regularity is better, safety has made tremendous gains, and traffic is up. Hope and faith have returned, and charity is on its way out."

Johnson indicated belief that the airlines have tried only half-heartedly to consolidate their airport operations ". . . a more aggressive approach toward consolidated operations would produce savings without sacrifice in service. If CAB eliminated some of the lone-wolf duplicating operations as legitimate expenses in determining mail pay we would have a very different story."

He took notice of CAB delays in major cases, and the applicant's expense and time required, which "can lead the average citizen into financial ruin." Each of the four major applicants in the air freight case had testified that his costs so far had been from $70,000 to $100,000 to pursue certificate efforts. "I wonder how much the A. T. A. and the certificate carriers have spent in opposing them?"

Johnson spoke favorably of the first-of-the-week family fare plan and special excursion rates. But "no one will deny that of these three, air coach has had the most spectacular effect on development of real mass air transportation."

The senator took issue with the position taken by some airline officials before his committee that there is nothing wrong with the industry that bigger and better mail pay won't cure. He noted that total mail pay (domestic and international) jumped from $42,967,000 in 1946 to $69,489,000 in 1947; $111,521,000 in 1948, and an estimated $125,000,000 in 1949.

He said Congress should decide whether the airlines are to be a regulated public utility or live under the law of the survival of the fittest. "Today airlines are neither beast nor fowl and therefore receive support from the public treasury to insure competition."

"I find keen cut-throat competition everywhere—shown by excessive scheduling, luxurious passenger extras, and extravagant promotional advertising of all kinds. To me, excessive competition purchased with federal funds is riduculous . . . Either the industry must submit to full government regulation with less competition or run the risk of financial failure resulting from its own mistakes. At the same time a way must be found to provide adequate air service to local and intermediate cities that will benefit and can reasonably support air service."

The senator asserted that in the postwar crisis there have been "plenty of justifiable criticisms" of the airlines, CAB, and Congress.

It is rare, indeed, that a member of Congress has given evidence of such a grasp of the problems of air transportation, and such an unwillingness to permit his judgment to be swayed by the happy but irrelevant thunderings of the propagandists. If the entire committee displays the qualities of the chairman in its recommendations, the industry should see hope of sound legislation on Capitol Hill.

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Mr. Edward T. Bolton, Vice-President in Charge of Operations, Philippine Air Lines

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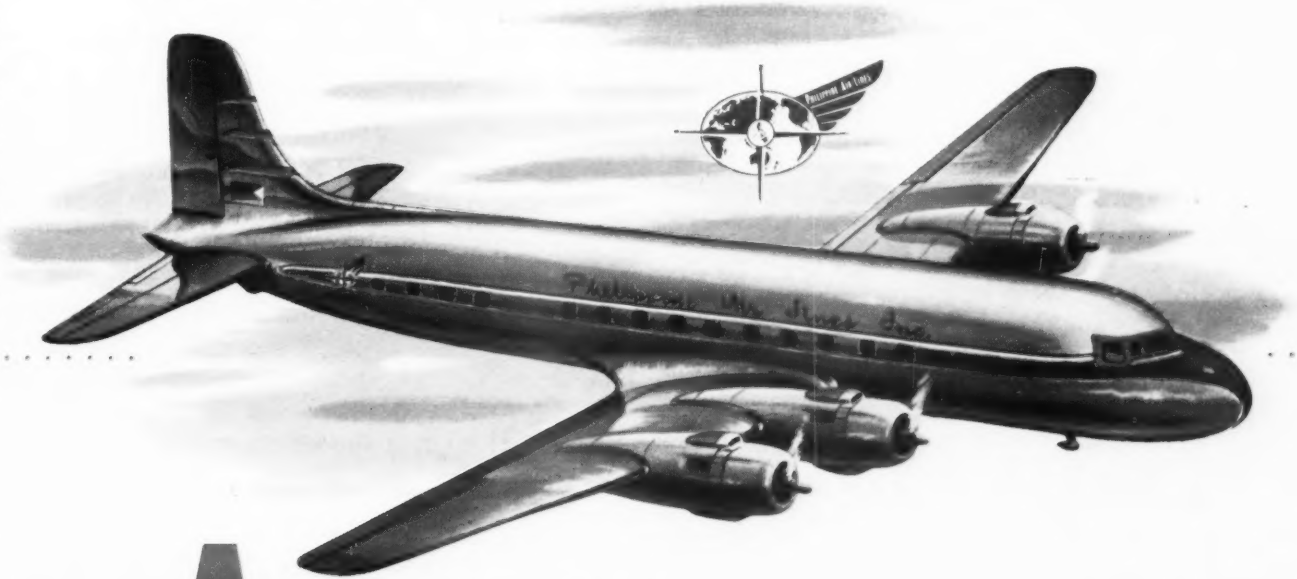

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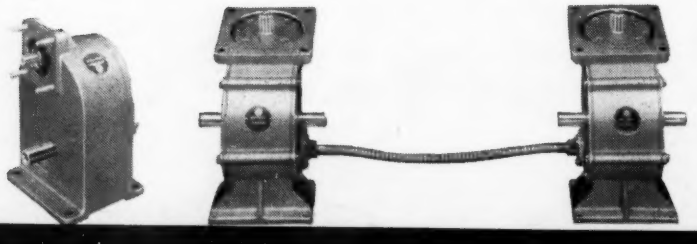

Leading edge and trailing edge wing flap actuators produced by Foote Bros. for the twin-jet McDonnell XF-88.